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Although it is difficult to discover who first recorded a case of carcinoma of the prostate, it is to Sir Henry Thompson that we owe the first clear description. He showed a case in 1854 at a meeting of the Pathological Society, and in 1857, when he published his book on "Diseases of the Prostate," he was able to collect 18 others from the literature. The earliest in this series is one described by Langstaff in 1817. An autopsy showed that "the bladder was almost filled with a fungous tumour of loose coagulated blood, mixed with a white pulpy substance, which derived its origin from the back part of the prostate."

Thompson regarded the disease as a rarity, though he was the first to point out that it was often overlooked through confusion with simple enlargement. Since then it has gradually been recognised that the condition is, unfortunately, common.

INCIDENCE

Albarran and Hallé found carcinoma in 10 per cent. of prostates removed surgically. Young, from clinical observations, considered "that four men in every hundred who live to be 60 years of age will have cancer of the prostate." Prostates removed at autopsy and submitted to a routine histological examination show the disease to be yet more frequent. In 54 prostates removed post mortem from men over 60 years of age in the Middlesex Hospital, unsuspected carcinoma was found to be present in 13 per cent. In those over the age of 70 carcinoma was found in 23 per cent.

These figures, based on a small number of glands, are of doubtful significance, but they serve to show the great frequency of the disease. Thus in those cases over 70, all dying from other diseases, one man in five had an unsuspected carcinoma of the prostate.

The apparent lack of relation between the post-mortem and the clinical frequency must be attributed to the mortality in the eighth decade from other causes, and the fact that cancer in this region may exist for some time before giving rise to symptoms.

RELATION TO BENIGN HYPERTROPHY

The view that benign hypertrophy was the chief predisposing cause of carcinoma was first advanced by Albarran and Hallé.

The atypical areas which they described and believed to be precancerous consist of small tubules, sometimes separated from each other by a certain amount of fibrous tissue. Such areas were present in over 9 per cent. of prostates examined histologically in this series and were found with equal frequency in hypertrophied lateral lobes and in the posterior lobe. Their significance is a matter of dispute; as Ewing aptly remarks, "early or suspicious changes are much more frequent than is the established disease." Some of these areas are undoubtedly the result, not of excessive epithelial proliferation, but of overgrowth of the periacinar fibrous tissue, leading to partial obliteration of the prostatic glands.

A number of authors have described early malignant changes in prostates removed for simple enlargement, but the fact that carcinoma can arise in an area of benign hypertrophy is by no means a proof that benign hypertrophy predisposes to malignant change. Of 134 prostates removed post mortem the pathological changes of benign prostatic hypertrophy were present in 80 per cent. of men over the age of 60. Considering the great frequency of this change it is not surprising that almost all cases of carcinoma are associated with it. A fact of more significance is that the majority of urologists believe cancer to arise more commonly in the posterior lobe. The changes of benign hypertrophy are rarely seen in this site.

Chronic prostatitis, which is often associated with calculi, has also been considered a possible predisposing cause of carcinoma.

The prostate is usually small and, on section, scattered dark particles may be seen throughout the gland, with a few larger calculi around the urethra. The ducts and acini contain pus cells and the stroma is fibrotic. Some of the acini lose their lining epithelium, acquiring a cystic appearance, while in other areas the ducts and acini are lined by several layers of darkly staining cells. Krompecher believed that this was the result of an inflammatory hyperplasia of the supporting epithelium of the ducts and that squamous carcinoma, a rarity in the prostate, arose in such areas.

Prostatic calculi are not a frequent accompaniment of carcinoma, nor does a history of urethritis appear to be more common in prostatic carcinoma than in other cases. In the cases examined, a history of gonorrhœa was present in 13 per cent. of carcinomata and 15 per cent. of non-malignant prostates.

Carcinoma may arise in a normal prostate, in areas of benign hypertrophy, or in a gland which is the seat of chronic inflammatory changes. There is no evidence of any predisposing cause. Age appears to be the only factor influencing its development.

CLINICAL TYPES OF THE DISEASE

In most cases the symptoms of prostatic carcinoma are similar to those of benign enlargement, and it is only on rectal examination that the correct diagnosis is made. A long history of urinary troubles is sometimes obtained, and in these cases it is probable that carcinoma has arisen in a prostate already the seat of benign hypertrophy. It is occasionally found in a patient who has previously had a prostatectomy. Here the growth may have been present a priori, and have been overlooked in the histological examination, or it may have started in that part of the prostate left behind in every enucleation prostatectomy.

In an interesting group the initial symptoms are caused by metastases in bones or in glands, and in a few cases urinary symptoms are absent throughout the course of the disease. Of these extra-urinary symptoms, pain in the back, lumbago, and sciatica, frequently bilateral, are the most common. Other uncommon initial symptoms are illustrated by the following cases.

A man of 70 noticed two months before admission to hospital a lump in the right groin. He had no urinary symptoms. The gland in the groin was removed and biopsy showed a deposit of undifferentiated carcinoma. The patient died a few weeks later and a post-mortem showed carcinoma of the prostate with secondary deposits in the abdominal, pelvic, and inguinal glands.

It is interesting at this point to quote a passage from Sir Henry Thompson. Referring to the involvement of lymphatic glands, he states "the existence of such swellings in the course of the iliac vessels, and sometimes in the inguinal regions, may frequently be verified by examination of the abdomen, and

* A Hunterian lecture delivered before the Royal College of Surgeons of England on Feb. 2nd.

constitutes a most valuable sign, when present, in relation to the diagnosis."

An unusual case is that in which the prostate gives rise to intestinal obstruction through involvement of the rectum.

A man of 60 was admitted with acute intestinal obstruction, pains in both legs and back, and œdema of the right leg. Rectal examination showed almost complete occlusion of the rectum by a prostatic carcinoma. The patient had never suffered from any urinary symptoms. He died shortly after admission. An autopsy showed carcinoma of the prostate with secondary deposits in glands and in the lumbar vertebræ.

The diagnosis is made mainly upon rectal examination. While the prostate may or may not be enlarged, it is characteristically hard. Of this Thompson states that "the patient's powers do not always sustain him to as late a period as that in which the growth either softens or fungates." Cystoscopy may show an œdematous condition of the trigone, nodules in the vesical mucosa, or an ulcerated growth. Other pathological conditions which may give difficulties in diagnosis are calculi, a small fibrous prostate, and tubercle.

In all cases an X ray examination of the pelvis and lumbar vertebræ should be made. This will sometimes confirm the diagnosis by showing the presence of metastases in bone. It will also reveal the presence of calculi when these are present, though a diagnosis of this condition can usually be made by the characteristic grating sensation felt per rectum or on the passage of a urethral instrument.

HISTOLOGY

With the exception of epithelioma, a very rare growth, all prostatic carcinomata are adenoid in nature, though the tendency to tubule-formation varies with different growths and to some extent in different areas of the same growth.

The extremely high mortality of this disease is well known and is attributable to the frequency with which metastases occur. The fact that in a small number of cases secondary deposits may be absent at autopsy is therefore of importance, since it is conceivable that in such cases radical surgery might be of benefit.

In order to correlate the histological appearance of the growth with the presence or absence of metastases I have studied the histological material from 48 cases of carcinoma, in 24 of which a post-mortem was performed on patients dying from the disease.

The cases have been divided into three groups based on the tendency of the primary growth to reproduce the prostatic tubules. The obvious fallacy of this method lies in the fact that variations may occur in the same growth. Certain cases, however, fall easily into Group I. (where the degree of differentiation is high) and into Group III. (undifferentiated growth), while of necessity Group II. contains a number of "border" cases.

Group I. (Fig. 1).—This includes those cases in which the prominent feature of the growth is tubule-formation. The tubules are smaller than those of the normal prostate, and may show branching processes. The cells, cubical or columnar, are regular in size. Mitotic figures are absent. The tubules may be closely packed together—or separated by a variable quantity of fibrous stroma. The appearance may closely resemble benign hypertrophy and render diagnosis difficult. This type of growth predominated in 12 out of 48 cases (25 per cent.) but included in this figure are 5 cases in which the growth at autopsy was in an extremely early stage and was not the cause—or associated cause—of death. It was present in only 4 out of 24 post-mortems on patients dying of the disease (16·6 per cent.).

Group II. (Fig. 2).—Half the cases are in this group. The tubules are less frequent—not so well formed—and masses of spheroidal cells containing spherical spaces are common. In these masses mitotic figures may be present and the cells are less regular than in Group I.

Group III. (Fig. 3).—Those cases in which the bulk of the growth is undifferentiated—with little or no attempt at tubule-formation. The masses of small spheroidal cells which form the histological picture resemble closely round-celled sarcoma. McKenzie described a case in which the general structure was identical with lympho-sarcoma, and Ewing believes that a number of the prostatic sarcomata recorded have in reality been of epithelial origin. Variations in the cells and mitotic figures are more common in this group, which formed 12 out of 48 cases (25 per cent.).

The relation between the type of the growth and the presence of metastases is best illustrated by the results of the autopsies performed on 24 patients dying from carcinoma of the prostate.

Group.	Cases.	Metastases present in	Average duration of life in months.
I.	4 (17·0%)	1	18
II.	14 (58·0%)	12	14
III.	6 (25·0%)	6	8

From these it will be seen that metastases were least frequent in Group I., and present in all cases in Group III.

Group I.—Four cases. In three of these cases no evidence of glandular or other metastasis was discovered. The fact that the average duration of life is longest in Group I. is important in showing that the absence of metastases cannot be attributed to a relatively early death.

Group II.—Fourteen cases. Metastases were present in glands or other organs in twelve of these cases.

Group III.—Six cases. Metastases were present in all these cases and the average duration of life was only eight months.

We may say then that a highly differentiated growth is not common in prostatic carcinoma, but that when it occurs the average duration of life is longer and metastases are less common.

LYMPHATIC DRAINAGE

The lymphatics in the prostate follow the vessels and nerves, and empty into a periprostatic lymphatic plexus from which four main collector trunks arise. Three of these pass to the external iliac, internal iliac, and sacral glands, while the fourth joins with the lymphatics from the urethra and accompanies the internal pudic artery.

In those cases in this series coming to autopsy, glandular involvement was present in 77 per cent.—the internal iliac glands being those most commonly involved.

Glandular involvement (per cent.).—Internal iliac 73, external iliac 50, lumbar and aortic 42, inguinal 23, thoracic 19, and supraclavicular 19.

Visceral metastases.—These were present in 34 per cent. of the autopsy cases, as follows: lung, 19 per cent.; liver, 15 per cent.; suprarenals, 8 per cent.; kidney, skin, dura mater, heart, and wall of ureter, 4 per cent. each.

Bone metastases.—While Thompson published the first case of bone metastasis in carcinoma of the prostate, the classical description is that given by von Recklinghausen in a Festschrift written in honour of Virchow in 1871, an article famous, not only for the description of osteoblastic carcinoma, but also of generalised osteitis fibrosa.

Von Recklinghausen pointed out the osteoblastic tendency of the bone metastases; he believed that

they reached the bones by the blood stream and that the involvement of muscular attachments was due to growth leaving the bones by the issuing veins. The frequency claimed for bone metastases varies with different writers, and obviously depends on whether a careful routine examination of the bones has been carried out at autopsy. Kaufmann, in 24 autopsies, found bone metastases in 16.

Metastases were found at autopsy in 28 per cent. of my series of cases. The frequency with which lymphatics were believed to be absent from bone, and their presence is still disputed. Kolodny's work, however, is strongly in favour of their existence. He injected Indian ink into the marrow cavity of a dog's femur and found traces of it in the inguinal glands three to five weeks later.

Kolodny believes that secondary deposits of carcinoma reach a bone by a retrograde spread from the regional lymph nodes, which are first involved. This work certainly provides an explanation of the frequency with which cancer of the thyroid will give rise to metastases in the

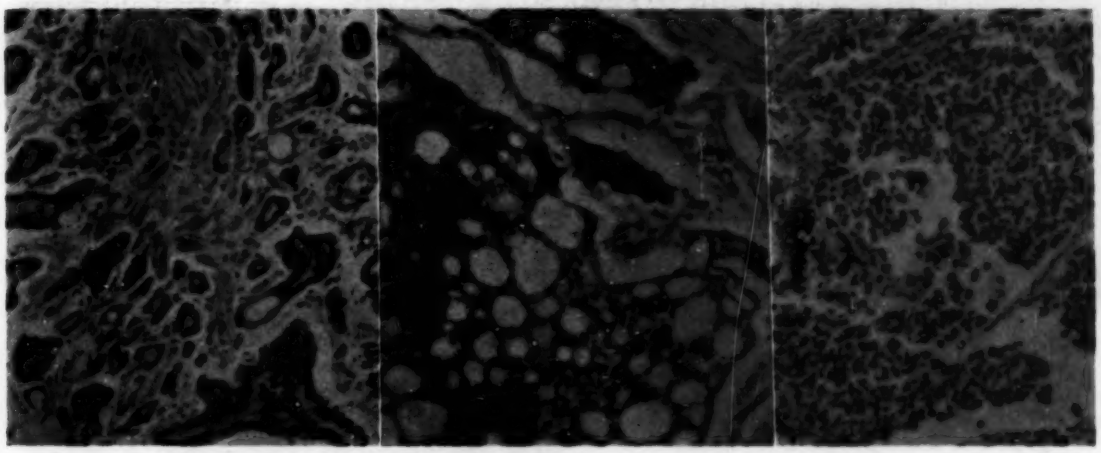

FIG. 1.—Carcinoma of prostate. Group I. (× 100.)

FIG. 2.—Group II. (× 100.)

FIG. 3.—Group III. (× 100.

the different bones were involved is compared, in the following Table, with the findings of Blumer.

Blumer.		Present series.
Vertebræ	Humerus	Vertebræ
Ribs	Tibia	Pelvis
Pelvis	Scapula	Ribs
Femur	Clavicle	Femur
Skull	Fibula	Skull
Sternum	Forearm	Clavicle

The most common sites for metastases appear to be the fourth and fifth lumbar vertebræ and that part of the bony pelvis which forms the pelvic brim.

The route followed by metastases in reaching bone is a matter of dispute.

Vascular route.—A growth arising in the prostate has on its outer aspect the prostatic venous plexus; within, beneath the urethral mucosa, are many thin-walled channels. In whole sections of prostatic carcinoma it is not uncommon to find cancer cells in both these situations. Pulmonary metastases were present in 19 per cent. of the post-mortems, but this figure probably under-estimates the frequency with which they occur, since Schmidt has shown that small numbers of cancer cells may be present in the lungs without macroscopic evidence of growth. The belief in the vascular dissemination of a growth is dependent on the passage of the cells from the pulmonary to the systemic system, and Schmorl has shown that cancer cells may spread along the capillaries to reach the pulmonary veins.

The bones chiefly involved by metastases in any growth are the vertebræ, ribs, pelvis, skull, and the proximal ends of the long bones. Piney's explanation for this is that it is in these sites that the red bone-marrow persists in adult life, its vascular channels forming a suitable nidus for an embolus to lodge.

Lymphatic route.—The view that a growth could give rise to a bone metastasis by a lymphatic route was first put forward by Handley. At the time when von Recklinghausen described bone metastases in prostatic carcinoma skull, and cancer of the prostate to deposits in the pelvis and lower lumbar vertebræ.

It does not appear possible to explain the frequency with which adjacent bones are involved in prostatic carcinoma on any theory of vascular dissemination, nor all cases of bone metastases by the theory of a lymphatic route.

OSTEOBLASTIC CARCINOMA

Skeletal metastases in carcinoma of the prostate are characterised by their osteoblastic character, this change being present in about 80–90 per cent. of bone metastases. The new bone which is formed may be soft and spongy or as hard as ivory; the whole of the medullary cavity may be involved or localised deposits may be present.

Von Recklinghausen believed that the tumour cells blocked the venous sinuses and gave rise to a condition of congestive hyperæmia leading to the growth of osteoid tissue and bone. It is generally believed at the present time, however, that congestive hyperæmia is more likely to lead to bone-resorption than to bone-formation. Other observers have even suggested that the actual tumour cells assumed the functions of osteoblasts and laid down bone. This is foreign to the belief that bone can only be produced by connective tissue cells.

These osteoblastic changes are not limited solely to secondary deposits from prostatic carcinoma. They do occur, though to a less extent, in other cases of cancer. It does not seem necessary to put forward any other theory as to the cause of the new bone-formation if we remember that the cells of the fibrous reticulum in the bone-marrow are all potential osteoblasts, and can assume this function when stimulated to activity. Connective tissue always tends to form a stroma to a malignant epithelial growth; this is particularly marked in

prostatic carcinoma and gives the primary growth its characteristic hardness.

Fig. 4 shows a very early deposit of prostatic carcinoma in the bone-marrow of a vertebra. Already a stroma has been formed around it by proliferation of the connective tissue cells of the marrow. Under the high power (Fig. 5) young fibroblasts can be seen at the periphery of the growth.

Fig. 6 represents a further stage. Here osteoid tissue and bone are being laid down in the stroma. Some of the stroma cells are now indistinguishable from osteoblasts and are already enclosed in developing new bone.

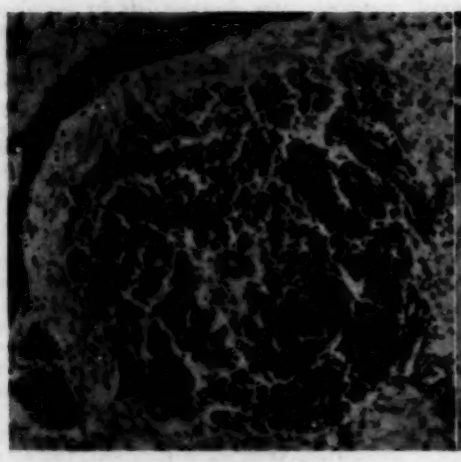

FIG. 4.—Early deposit of prostatic carcinoma in bone. (× 70.)

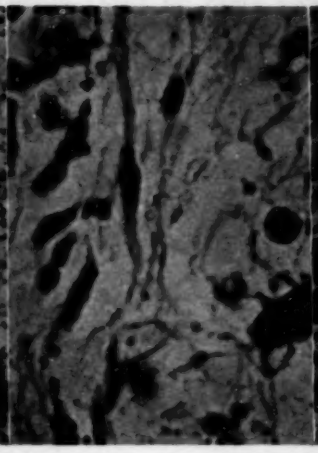

FIG. 5.—Edge of growth from Fig. 4 showing fibroblasts. (× 450.)

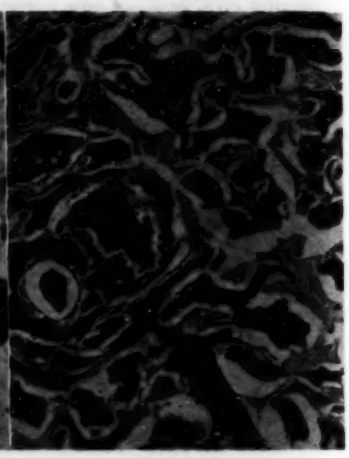

FIG. 6.—Secondary deposit in bone. New bone-formation in the stroma. (× 50.)

Fig. 7 shows a fully developed stage. Instead of a fibrous stroma there is now a stroma of new bone lined in many areas by osteoblasts.

Fibrosis of the marrow, followed by the development of bone, also takes place in the neighbourhood though not necessarily in close contact to the secondary deposit. Fig. 8 shows the delicate fibrillæ of developing new bone. No growth is present in the field.

Bone is also laid down by apposition on fully formed bone trabeculæ. Apposition and resorption take place constantly in the normal skeleton, a delicate balance being maintained. The excessive apposition which may occur in these cases near a growth may be a response to weakening of the bone. Bone-destruction as well as bone-formation is always present in these secondary deposits and is sometimes predominant. Whether bone resorption can take place through the cells of the growth is doubtful, but a varying number of osteoclasts are usually present.

It is not uncommon to find areas in osteoblastic carcinoma which bear a close resemblance to generalised osteitis fibrosa. It would be of particular interest if there were other points in common between secondary carcinoma in bone and this condition. In 1923 Klemperer found hyperplasia of a parathyroid gland in a case of extensive bone metastases in carcinoma of the breast, and cases have been recorded of bone metastases in which, like osteitis fibrosa, the blood phosphatase was raised. I have never had the good fortune to find an enlarged parathyroid in a case of prostatic carcinoma with bone involvement, in spite of a careful search on many occasions.

In osteoblastic carcinoma, then, the new bone is formed in two ways: it is laid down in the stroma of the growth by the stroma cells and, following fibrosis, in the neighbourhood of the growth; it is also laid down by a process of apposition on the already present bone trabeculæ. The frequency with which this change takes place in deposits of prostatic carcinoma is probably due to the property of that particular growth for developing a marked stroma.

TREATMENT

The first point to be considered is the position which radical surgery occupies at the present time. If a radical operation for cancer of the prostate is to be placed on the same footing as that for carcinoma of the breast, and is to have some chance of success, it must be not only an enucleation, but the complete removal of the prostate and its sheath, with the internal meatus and trigone, the seminal vesicles, and, preferably, the pelvic lymph glands, together with the intervening lymphatics. Such an ideal operation would be exceedingly difficult to perform, but there are other operations which are practised by surgeons at the present time.

That planned by Young consists in the removal of the complete prostate by the perineal route together with part of the trigone, seminal vesicles, and ampullæ of the vasa differentia, while Morson has effected a similar clearance through the suprapubic route.

In a recent article Young states that he has operated upon 40 cases by this method with an operative mortality of 6 per cent. In a review of 25 cases operated upon more than five years ago he found 7 alive and without recurrence, and 12 cases which had died without recurrence. This gives a five-year cure of 48 per cent., a strikingly good result, though the fact that the operation has only been performed in 40 cases bears eloquent testimony to the low operability rate of the disease. Unfortunately Young's experience appears to be unique; in an article in the same journal Keynes states that he cannot report a single five-year cure.

Coffey believes that the only radical operation which has a chance of success is complete prostatectomy and cystectomy, preceded by implantation of both ureters into the bowel.

Before any radical operation is justified there must be a definite hope of permanent cure; if recurrence takes place the operation must prolong life, and in either case the patient's life must be a comparatively comfortable one. If we exclude those cases in which a small area of carcinoma is found in the centre of the prostatic tissue enucleated in a suprapubic prostatectomy for benign enlarge-

ment, it is probable that there are few permanent cures. It is certain that at the present time few surgeons or urologists in this country believe that any radical operation is justified.

A small number of cases of prostatic carcinoma will live for several months or years and at death no metastases are found. I have shown that these cases tend to be characterised by a highly differentiated growth, and I believe that it is in this type of case that radical surgery might conceivably be justified. The only efficient method of biopsy in prostatic carcinoma is an endoscopic resection. If therefore an early case of prostatic carcinoma without evidence of metastases or extensive local invasion were submitted to endoscopic resection, and histological examination showed the growth to be of a highly differentiated type, then I believe that some radical operation should be carried out. Unfortunately such a case is seldom seen.

PALLIATIVE TREATMENT

In order to ascertain the method of treatment which prolongs life to the greatest extent, I have reviewed a series of 45 cases of prostatic carcinoma treated at the Middlesex Hospital. All these have been proved cases of carcinoma, the diagnosis being confirmed in many of them by autopsy, in some by biopsy, and in others by radiographic evidence of bone involvement, which has been accepted as evidence of malignancy. In none of these cases has a radical operation been performed, but suprapubic enucleation prostatectomy, cystostomy, and endoscopic resection, together with deep X ray therapy and radium, have been used.

Suprapubic prostatectomy.—This operation was performed in nine of the cases. Suprapubic enucleation cannot be considered as anything but a palliative operation, since it cannot hope to remove more than part of the growth. In the surgery of cancer, however, an operation must not necessarily be condemned because it is purely palliative. Unfortunately it is doubtful if this operation prolongs the patient's life. It submits him to an uncomfortable operation with a definite mortality and a convalescence which all too frequently terminates in a permanent suprapubic cystostomy. For these reasons the operation is unjustified. The average duration of life after operation in these nine cases was 1 year, 5 months.

Cases.	Treatment.	Av. duration of life.
6	Prostatectomy followed by deep X ray therapy.	1 yr., 10 mths.
3	Prostatectomy alone.	7 months.

Suprapubic cystostomy.—Suprapubic cystostomy was performed in 18 cases. A simple operation with a low mortality, it need not be performed when first the diagnosis is made, but should be delayed till the patient requires it. The average duration of life in these 18 cases was two years.

Cases.	Treatment.	Av. duration of life.
5	Cystostomy + deep X ray therapy.	3 yrs., 6 mths.
5	Cystostomy and radium.	1 yr., 6 mths.
8	Cystostomy alone.	1 ,, 2 ,,

If we compare those cases treated by prostatectomy with those treated by cystostomy it appears that the duration of life is definitely longer in that group of cases treated by cystostomy and deep X ray therapy.

Endoscopic resection.—This was performed in five cases. The value of this operation lies in the fact that, though it only removes that part of the growth around the internal meatus, it relieves the patient of his obstructive symptoms, it confirms the diagnosis, and it renders a suprapubic cystostomy unnecessary. Another condition in which it may be of value is hæmorrhage from an ulcerated growth.

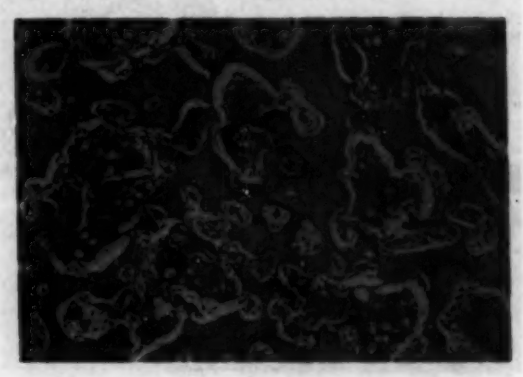

FIG. 7.—Secondary deposit with a stroma of new bone. (× 70.)

Deep X ray therapy.—The effect of deep X ray therapy on the duration of life in prostatic carcinoma is best illustrated by a comparison of cases.

(*a*) *Suprapubic Prostatectomy* (9 cases)

Cases.	Treatment.	Av. duration of life.
6	With X ray therapy.	1 yr., 10 mths.
3	Without X ray therapy.	7 months.

(*b*) *Cystoscopy* (18 cases)

5	With X ray therapy.	3 yrs., 6 mths.
5	With radium.	1 yr., 6 ,,
8	Without X ray or radium.	1 ,, 2 ,,

Though I do not know of any case in which X ray therapy has effected a cure, these figures, taken from Dr. Webster's clinic at the Middlesex Hospital, show that it prolongs life.

Webster states that following a course of X ray therapy some temporary remission of symptoms and reduction in the size of the growth takes place in the majority of cases. He believes that this treatment will effect still greater improvement in the future, since in the past the majority of cases were treated by methods which gave insufficient dosage according to the most recent principles of radiotherapy. The suggested method is that the patient should have daily doses of X rays spread over two or three weeks and that further treatment, if thought desirable, should be given in four to six months' time.

An objection which is frequently raised against the use of deep X ray therapy in malignant disease is the extreme nausea which it produces in a number of patients. It has been shown that one of the effects of X ray therapy is a diminution in the blood cholesterol. Injections of cholesterol have been used in the treatment of this nausea but Dietel, working in Eymer's clinic in Germany, has produced better results by the injection of liver extract. 1–2 c.cm. of Boots liver extract injected intramuscularly has produced markedly beneficial results in cases treated at the Middlesex Hospital.

Radium.—The treatment of prostatic carcinoma by radium has been tried in five cases, the radium

needles being inserted through the perineum. The average duration of life was 18 months. Young advocates radium treatment if a radical operation is contra-indicated, but in these cases it does not appear to have had such good results as X ray therapy.

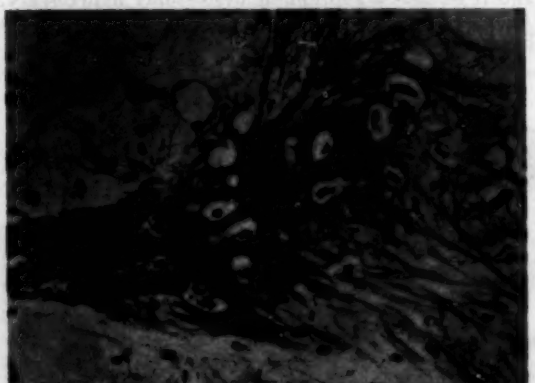

FIG. 8.—New bone-formation in proximity of secondary deposit. (× 300.)

SUMMARY

Any attempt to assess the value of the different methods of treatment in this disease is rendered difficult by variations in the patient, the duration of symptoms, and the disease.

Through the situation of the growth, the absence of symptoms in some patients and their late onset in others, the great majority of cases are unsuitable for any radical operation. When obstructive symptoms arise they should be relieved by suprapubic cystostomy or endoscopic resection. There is evidence that deep X ray therapy prolongs life.

In an early case an attempt should be made to determine the histology of the growth and confirm the diagnosis by endoscopic resection. If the growth appears to be of relatively low malignancy then some form of radical operation would be justified. Obvious fallacies exist in the grading of any growth, but if a patient can live for two years with cancer of the prostate, and at death show no evidence of glandular or other metastases, then it is surely conceivable that such a patient might have been cured by a radical operation if it had been performed at an early date.

This view is from a theoretical rather than a practical standpoint, a pathological rather than a surgical. The evidence to support it comes not from the quick, but from the dead. That need not lessen its value. Over the door to the post-mortem room at the Middlesex Hospital is engraved:

"Hic locus est qua mors gaudet succurrere vitæ."

I am indebted to the surgical staff of the Middlesex Hospital and the Bland-Sutton Institute for cases and pathological material.

BELFAST SAMARITAN HOSPITAL.—At the recent annual meeting it was stated that last year there were 783 new in-patients and 1248 new out-patients. The average stay of the admitted patients was 14½ days; the average weekly cost per patient was the low figure of £2 8s. 3d.

LOWER SEGMENT CÆSAREAN SECTION AS A ROUTINE*

A REVIEW OF 119 CASES

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MY purpose in this paper is to advocate the performance of the lower segment operation in all cases where abdominal delivery is deemed necessary—whether the patient is or is not in labour, and may or may not have been infected. Its advantages are a relatively sound operative result, an easier convalescence, and greater safety.

There is no object at this stage in again reviewing the history of the operation. This has been adequately done in admirable papers by Munro Kerr, Schweitzer, St. George Wilson, and others. The particular indication for the lower segment operation as opposed to the classical one has also been well described. I shall refer to previous authors, therefore, only when points they raise affect my theme.

THE LOWER SEGMENT

R. W. Johnstone defines the lower segment as the relatively thinned lower portion of the body of the uterus which is present during the last two or three months of pregnancy. Undoubtedly it becomes clearly and fully developed only after labour has begun, but presumably it is present, though less clearly defined, before this stage; and certainly at operation the uterine wall in this region is observed to be definitely thinner than it is at a higher level.

It is permissible therefore to speak of the lower segment operation even if the operation be carried out before labour commences. (Many American authors speak of a cervical Cæsarean section.) I emphasise this because a large proportion of my cases were operated upon before labour, and these are the ones which have most clearly demonstrated to me the soundness of this particular technique. It is well known that the lower segment operation has a place of its own. As has been pointed out, it can be done at a late stage of labour and in an infected patient with much greater safety than can the classical operation. As St. George Wilson says, it allows of a preliminary trial of labour, with safety to mother and child, even if abdominal delivery has to be resorted to later; and in this way delivery per vias naturales can often be effected in the cases with minor degrees of pelvic contraction. In this connexion I would say that this routine has been carried out by me and that the cases operated upon before labour presented so bad an obstetrical situation as not to warrant a trial of labour.

Of my series of 119 cases, 54 were operated upon during labour and 65 before labour began. This series represents all my cases during the last four years (since January, 1930), both in hospitals and private homes. Fifty-five of the operations were performed at St. Mary's Hospital, and I am indebted to members of the honorary staff in reporting these. During these four years I have used the technique exclusively, irrespective of the type or condition of

* Based on a paper read before the North of England Obstetrical and Gynæcological Society on Jan. 26th. (The series has been enlarged by ten cases.)

the patient, and the results here published are therefore fully representative.

TECHNIQUE

I venture to outline the technique of the lower segment operation, with particular reference to points which seem to play an important part in its ease of performance and consequently, by minimising the time taken, the degree of shock and the liability to complications, to make for the perfect end-result. The routine technique has of course been adequately described by others, and it is only in matters of detail that any further description can be of interest.

The Horizontal Position.—After the usual preparation the patient is placed on the operating table in the horizontal position and the operation is carried out with the patient in this position.

At the outset I must express my views with regard to the advantages of this position over the alternative one of the Trendelenburg or modified Trendelenburg used by many operators and detailed by St. George Wilson.[1] I consider that when even a modified Trendelenburg position is used there is a tendency to embarrassment of the diaphragm because of the proximity of the fundus of the uterus in consequence of a sagging-down of the uterine body as a whole. The patient's breathing is more difficult and the anæsthetic more awkward to administer.

Again when the Trendelenburg position is used, the whole weight of the body of the uterus pulls on the lower segment and definitely puts it on the stretch. This may make it easier of access, but it also increases the liability of the incision through the lower segment to split when extracting the child—particularly the presenting head. When the horizontal position is used the lower segment has its normal elasticity and splitting of the incision is less likely.

Further, when operating with the patient in the Trendelenburg position one is faced with the effort of extracting the presenting head against the weight of the child itself, and fundal pressure if used at this stage has to be exerted uphill, as it were. Great force is necessary to produce the same effect as gentle pressure exerted in the horizontal position. Advocates of this position therefore usually resort to the use of one or both blades of the forceps to assist in the extraction. The horizontal position, on the other hand, facilitates extraction of the presenting head by allowing the weight of the child's body to act as a force downwards in the direction of the uterine incision.

Lastly, when the Trendelenburg position is used there is an increased liability for the blood and liquor to run down into the upper abdomen, however well packed-off this may be beforehand, after the child is removed; the diminution in the size of the uterus is apt to allow sufficient space for this to occur. The actively bleeding incision—into a sac filled with possibly infected fluid—is at a higher level than the general abdominal cavity. One is asking a lot therefore of the swabs used in packing this cavity off. In the horizontal position, the incision through the lower segment is at a lower level than the abdominal cavity, and blood and liquor readily escape over the lower end of the abdominal incision to the exterior. The classical operation is of course carried out in this position.

Subumbilical Incision.—The abdominal incision is entirely subumbilical. The peritoneum incised is loose. The degree of shock is therefore always likely to be less than in a laparotomy in which the abdominal incision partly involves the upper abdomen, as in the classical operation.

Semicircular Incision through the Lower Segment.—After the lateral aspects of the abdominal cavity are packed in the usual way, and either a Doyen retractor or self-retaining separator retractor has been introduced at the lower end of the abdominal incision, the lower uterine segment is incised. Different types of incisions have been used by various operators: the vertical incision largely used in Germany has been known to be followed by rupture into the bladder with fatal results, both during the operation and as the result of giving way of the scar at a subsequent pregnancy.

A transverse incision is usually employed, but in my opinion is one which may very likely split during delivery of the child's head with probably serious hæmorrhage resulting from tearing of the uterine vessels. An elliptical incision is undoubtedly better and in all my cases I have exaggerated this shape so as to make sure that the ends of the incision point directly upwards—parallel to the sides of the lower segment. The shape of the incision is therefore semicircular with its convexity down and its middle point clearing the reflection of the peritoneum over the bladder by about quarter of an inch.

I believe that this particular incision has great advantages. Its shape discourages splitting during the extraction of the child, and even if splitting occurred it would be in an upward direction away from the main vessels at the side. In my series I have never been troubled by this complication during the operation, a fact which I attribute to the type of incision used. Again, the aperture in the lower segment resulting from this incision is the maximum which can be obtained in the area provided, and greater use of the normal elasticity of the lower segment can be made by means of it than many others. Moreover, a larger object can be extracted without difficulty through an aperture shaped in this way than through one of the same length less curved. The greatest access and the least risk is therefore available with the use of this semicircular incision.

The peritoneum is incised and reflected in the usual way before incising the muscle itself.

Bimanual Extraction of the Presenting Head.—The operator's hand which is at the lower level relative to the long axis of the patient is introduced through the incision and passed round the vault of the child's head to the posterior aspect. The fingers of the upper hand retract the upper flap of the uterine incision and, in conjunction with firm, uniform fundal pressure by the assistant, the presenting head is shelled out through the incision and the child's body delivered thereafter. It is in this manœuvre that the access given by the semicircular incision, and the elasticity of the lower segment associated with it, is appreciated. Even in cases in which the child's head is jammed in the pelvic brim as the result of severe moulding or a large caput, there is no difficulty in the extraction by this means.

In my series I have never found it necessary to employ the forceps at this stage. I do not deprecate the use of one blade only as an elevator—except in so far as a relatively sharp and somewhat unwieldy metal instrument is being used inside a thin-walled space, in which the end of the instrument may not be perfectly controllable especially in conjunction with a semi-fixed head. I do, however, consider that the use of both blades is not a sound procedure, since in extracting the child's head through a limited incision in soft tissues such as this it is essential to gauge the strain upon the incision and to manœuvre

the head so as to minimise this as far as possible. This can only be done satisfactorily by using the lower placed hand as an elevator and guider.

Expression of the Placenta.—The uterus, at this stage, is lifted out at the abdominal incision and assisted to actively contract by antero-posterior compression between warm swabs. In this way the placenta is quickly expressed to the level of the uterine incision whence it can easily be removed by traction on its membranous surface. This procedure militates against the necessity for removal of the placenta by separating with the hand in utero; an action which definitely increases the danger of the operation, from the sepsis point of view, and particularly in those cases which are presumably infected beforehand. Where the abdominal wall is thickened by adiposity or muscular development it is often very difficult to express the placenta quickly enough if the uterus be allowed to remain in the abdomen, and in these cases, therefore, resort is more likely to be had to manual removal by stripping, which is to be deplored. My experience shows that no shock is attendant upon lifting out the uterus at the abdominal incision.

I do not express the placenta per vaginam, as of course in cases operated upon before labour the dilatation of the cervix is inadequate.

Stitching the Uterine Incision.—In known clean cases—namely, those operated upon before labour and those in early labour with no previous interference—I recommend using two layers of catgut (No. 2 chromic) only, the first to include the endometrium and lower half of the muscle in continuous suture, and the second to include the upper half of the muscle and peritoneum in continuous suture. In this way the amount of buried catgut is minimised whilst adequately apposing the cut surfaces. Any slight amount of blood escaping through the incision can be prevented from reaching the pelvic cavity by the relatively loose peritoneum between the strands of catgut employed in the upper suture. In any case possibly infected, it is as well to stitch the peritoneum separately over the uterine incision which itself is closed by two continuous sutures. Scott,[3] of Toronto, mentions the layer of fascia which is continuous with the lower segment, which can be found and closed separately if necessary. He remarks that this layer is important in helping to keep the incision extraperitoneal. The retraction and swabs are removed, the abdominal and pelvic cavities inspected and freed from blood if necessary, and the abdomen closed.

I have described the main details of the technique as I have carried it out in my series, mainly because of the slight differences only which exist between it and that employed by various other operators. The Trendelenburg position is used by some. Phaneuf[3] suggests a transverse incision through the lower segment. He closes the incision in two layers, the lower of which is by interrupted sutures. Danforth[4] uses a vertical incision, and covers it entirely by suturing the bladder well over it. He also employs the forceps to extract the head as a routine.

RESULTS

Mortality.—In this series of 119 cases there were no maternal deaths. Sixty-five were operated upon before labour and were therefore in good condition. Of the 54 in labour, 15 were in labour more than 18 hours, and in 8 cases the membranes had been ruptured more than 10 hours. In 9 cases the patient had been in labour 32–72 hours, and the pulse-rate was relatively high prior to operation. There were 9 cases in which the placenta was partly occupying the lower segment, and in 1 case there was antepartum hæmorrhage in consequence of this. There were 2 cases of concealed accidental hæmorrhage and 1 of eclampsia.

A few patients, however, might have provided a mortality-rate in this series through chest complications contracted during puerperium. An element of chance enters, therefore, into this factor. Greenhill[5] reports 9 maternal deaths in 807 cases at the Chicago Lying-in Hospital—a rate of 1·1 per cent. Piper and Bachman[6] had 3 maternal deaths in 73 cases.

Morbidity.—Of the 119 cases, 21 had a morbid puerperium in so far as the temperature reached 100° F. on at least two consecutive days after the third post-operative day. Of these 8 were due to chest complications and 4 to urinary or renal infection. Breast infection accounted for 2 cases. A reactionary temperature of 100° F. or more was recorded in 21 cases during the 48 hours following operation.

Infantile Mortality.—Six children were stillborn, one being affected by hydrocephalus and spina bifida. Two of the stillbirths were associated with concealed accidental hæmorrhage, and in one case the mother had valvular disease of the heart. One child was asphyxiated, and one died on the second day after birth. In this case there was a central placenta prævia, and there had been considerable unavoidable hæmorrhage before operation. Seven of the 119 children therefore failed to survive during the two days following the operation (5·9 per cent.).

SUMMARY

It remains only for me to add my conviction to that of many other writers that the lower segment technique makes for a sounder result, both in respect of the immediate post-operative convalescence and the end-result from the point of view of remote intra-abdominal complications and further pregnancies. One has only to observe the uterine incision after suture—its complete protection from the abdominal contents by the body of the uterus which is itself intact—to realise the greater post-operative safety which this operation offers when compared with the classical operation. I agree with St. George Wilson in the main points of his comparison of the two operations—that the lower segment technique allows a trial labour with minimum danger, the mortality is lower, the convalescence smoother, the danger of subsequent pregnancies negligible. I would, however, contend with him that there is still a definite place for the induction of premature labour, by mechanical means if necessary.

I agree with Phaneuf that this technique offers protection against post-operative peritonitis due to effusion of infected fluid through the uterine incision, as is possible in the classical operation; and I will say in addition, that the post-operative intestinal distension (proceeding in some cases to ileus) commonly observed after the classical operation is largely due to the absorption of the blood which is squeezed into the abdominal cavity through the uterine incision, by active contraction of the body of the uterus, during the hour or two immediately following operation. Danforth says that even in uncomplicated cases there are always organisms in the lower pole of the uterus which will produce a degree of peritonitis if enough blood escapes into the abdominal cavity after the operation.

In 1925 I reported [7] two cases of rupture of a previous Cæsarean section scar as observed at laparotomy in a subsequent pregnancy and recorded my belief that the uterine scar had given way at about the thirty-eighth week as the result of intra-uterine pressure, the scar itself being thin and weak. Since then I have seen other cases in which the old scar in the uterine body was extremely thin and stretched and on the point of "rupturing." In numerous other cases strong adhesive bands were present between the uterine scar and the abdominal wall or dense omental and intestinal adhesions involved it, giving rise in some cases to chronic abdominal symptoms.

My experience is too limited to compare this remote result with that of the lower segment scar. I would say, however, that its very position prevents its involvement in this way. In the three cases in which I have operated by this technique for the second time, I have found the previous scar almost indistinguishable as such—a puckering of the peritoneum only marking its site. Two of three cases had also been delivered by the classical operation some time previously. Both showed badly healed scars and adhesion involvement. It is possible, of course, in the classical operation to minimise the risk of this by careful understitching of the muscle wall. The fact remains that it is surgically unsound to incise a thick, actively contracting and retracting muscle, if one anticipates healing by a perfect scar; and this fact is of extreme importance, since the life of the patient, apart from that of a child, may depend upon it.

Greenhill and Bloom report an examination of 37 cases of repeated lower segment Cæsarean section in which five scars were observed to be very thin. They believed this to be due to varying degrees of tension produced by the fœtal head near term. Brouha [8] says that rupture of the cervical scar is at least ten times less common than the upper segment scar. He reports that Tarnier found the scar to be perfect in 26 out of 28 repeated cases.

One case has been reported in which a cervical scar ruptured into the bladder with fatal results; but a vertical incision had been used and a weak scar had split along its length. Maxwell [9] records a similar case in which the bladder was not involved and the patient recovered. From these facts there is no doubt that the cervical incision must not be looked upon as altogether free from ultimate danger. On the other hand, the likelihood of this complication is relatively remote.

The somewhat increased difficulty in the operation itself in comparison with the classical type is not a material factor in the hands of the experienced gynæcologist. The relatively limited access; the relatively free bleeding in a confined space whilst making the uterine incision, especially when the placenta covers part of the lower segment; the possibility of difficulty in extracting the presenting head or of tearing the uterine incision during this extraction—points which I consider to be negatived by using the semicircular incision—all these make it necessary to have experience. The lower segment operation is not one to be undertaken by the occasional operator.

This operation, named by DeLee [10] laparotrachelotomy and first described by Frank 27 years ago, has been the subject of many reports since that time, particularly in America. It has stood the test of time, and in the United States to-day is performed in the larger hospitals almost exclusively under local anæsthesia. I have no hesitation in adding my recommendation of it as a routine. As far as my own experience goes, however, I would assuredly stress the necessity for the observance of those details in the technique which I have endeavoured to set forth here.

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PROTEINURIA IN CHRONIC NEPHRITIS

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In 1831 Dr. Graves, lecturing at the Meath Hospital, Dublin, and reported in the *London Medical Gazette* of that year, said:—

"Knowing as we do, that the serous effusions so copiously secreted by the vessels, in dropsical diseases, consists chiefly of water holding albumen in solution, we would naturally consider the appearance of albumen in the urine as a favourable symptom, proving the excretion of the morbid product by means of the kidnies and thus affording an outlet for the diseased secretion. . . . With reference to the existence of albumen in the urine of dropsied patients, I may remark that Blackall and Bright are both equally mistaken; the one in considering this sort of urine as always indicating the same treatment, the other in thinking that this albuminous urine is always connected with an appreciable organic change in the structure of the kidneys. . . . The celebrated J. B. Frank was the first to remark that certain forms of chronic dropsy present many points of similarity with diabetes."

This quotation was found from a reference by del Baere [1] (1931) who worked in Sumatra, and published in Germany. In a previous paper,[2] written with Dr. L. E. Bayliss, reference was made to some recent suggestions that the proteins which were excreted in nephritis were different from serum proteins, either by virtue of chemical or physical change or by "toxicity." Although it is apparent that the idea is over a hundred years old, the matter cannot be said to have been decided. The aim of the present work was to determine whether proteins from the urine of patients with nephritis were excreted by the healthy mammalian kidney. In the paper with L. E. Bayliss, already referred to, experimental evidence was given to show that normal serum proteins were not excreted by the kidneys of cats, dogs, or rabbits, even when the serum proteins were from a different animal, including man. Proteins with smaller molecular weights, as gelatin, egg-albumin, and Bence-Jones protein, were readily excreted by these kidneys.

METHOD

Ten cases of chronic nephritis were chosen among patients under the care of Prof. Arthur Ellis. Abstracts of the clinical notes are given in an appendix, together with post-mortem reports on three of the cases. A 24-hour specimen of urine was collected in the wards into a

Winchester quart bottle containing toluol. The laboratory preparations were begun about 9 hours after the collection of the last specimen. The volume of urine was measured, and its protein content estimated by a method previously described.[3] The urine was then dialysed. Cellophane membranes of the "sausage-skin" pattern were used, with sodium chloride solution, containing toluol, on the outer side of the membrane. The dialysis was continued for 24 hours, for 6 hours of which the outer fluid was constantly changing. The protein solution remaining inside the membrane was then concentrated at 38° C. in a shallow dish with an electric fan directed on to its surface. One or two drops of 100 per cent. phenol in alcohol were added. This was necessary as a preservative to replace the toluol which evaporated. The strength of the sodium chloride used and the amount of concentration of the protein solution were adjusted so that the final product should contain about 6 g. protein and 0·9 g. NaCl per 100 c.cm.—i.e., amounts comparable to those found in serum. The amount of protein was checked by direct determination. The solution was then put in the cold store until the animal experiment was performed, which was usually on the following day.

The animal experiments were done in the physiology department of the London Hospital Medical College, by kind permission of Prof. D. T. Harris. Cats were used with one exception: in the case of patient No. 9 a dog was used. The cats were anæsthetised by the intraperitoneal injection of "Liquid Dial." A cannula was introduced into the urethra through a small suprapubic incision, the operation involving little manipulation and taking only a few minutes. In some preliminary experiments the bladder was ligatured at a level above the trigone after it had emptied. This had the advantage that all the urine passed during the experiment went through the cannula into a measuring cylinder, and its rate of flow could be measured. Otherwise a bladder which had been very distended sometimes failed to empty completely during the experiment, even when a cannula projected through the urethral orifice. However, the practice was discarded as the procedure involved handling of the viscera, and also sometimes caused hæmaturia, which was apparently due to venous congestion of the trigone. The bladder was allowed to empty after insertion of the cannula, and suprapubic pressure was applied to assist. Flow-rate readings were not regarded as necessarily accurate, and the bladder was always examined at the end of the experiment. It should be emphasised that this difficulty arose only in the case of cats with very distended bladders. The volume of urine in the bladder was measured, and it was tested for protein.

The cats were left without interference for 20–30 minutes after the end of the operation, during which time the urine was collected and tested for protein. The protein or control solution, at a temperature of 38° C., was then injected through a needle into the femoral vein, taking about 5 minutes for a volume of 20 c.cm. The animal was then left for a further 1½–2 hours, during which time urine collection and testing continued.

RESULTS

Control experiments were done under the standard experimental conditions with the following results.

CONTROL EXPERIMENTS

Substance injected.	*Result.*
NaCl 0·9 g. per 100 c.cm.	No proteinuria.
NaCl „ +0·5% phenol	„
Horse serum	„
Horse serum +0·5% phenol	„
Horse serum + toluol, diluted × 20, dialysed, and reconcentrated with 0·5% phenol	„
Horse serum +2% urea +toluol, diluted ×20, allowed to stand 24 hours, dialysed, and reconcentrated + 0·5% phenol	Trace proteinuria.

In the 10 experiments with nephritic proteins no proteinuria occurred in 4 cases (Nos. 1, 2, 7, and 9); in the other 6 cases a trace of protein occurred in the urine immediately after the injection. There was no permanent proteinuria in any case. The concentrated urine pigment was always excreted. The traces of protein which occurred temporarily in some cases were too small for accurate determination, but it is estimated that the total amount of protein excreted was less than 1 per cent. of that injected. The significance of this small amount was further reduced by the observation made in the control experiments that temporary traces of protein in the urines of the same order occurred when horse serum was diluted and allowed to stand with 2 per cent. urea previous to being treated in the routine manner for the collected urines. Urea is known to denature proteins.

In one case (No. 4) plasma proteins, ultra-filtered from 30 c.cm. plasma and made up to the original volume with 0·9 g. per cent. NaCl per 100 c.cm., were injected. The plasma protein solution was prepared on the day of the experiment, for another purpose, by Dr. C. Wilson. No proteinuria resulted.

It is concluded that the proteins in the urine of patients with chronic nephritis are not permeable through a healthy mammalian kidney.

The single observation on plasma proteins is in agreement with the conclusions of Hayman and Bender,[4] who injected serum from three nephritic patients into healthy patients and found no proteinuria or other reaction. The concentration of nephritic proteins in the plasma of the recipient was about six times as great in the present case as in theirs.

It is regretted that no case of pure nephrosis, confirmed by post-mortem examination, was available during the period of this research. As such cases are rare, it was decided to publish these results and to hope that such opportunity might arise at a later date. One case in which the clinical diagnosis was amyloid nephrosis has been included.

SUMMARY

Proteins were separated from the urine of 10 cases of chronic nephritis by dialysis against NaCl solution, and were then concentrated at 38° C. to a strength of protein and salt about equal to serum. When injected intravenously into anæsthetised cats they were not excreted.

CLINICAL NOTES

The following abstracts concern patients in the beds of the Medical Unit, the London Hospital, under the care of Prof. Arthur Ellis. The full clinical notes of the cases were made, in most cases, by Dr. Horace Evans, formerly registrar to the medical unit. The special investigations were made in the clinical laboratory of the hospital. The post-mortem reports were from Dr. Dorothy Russell, of the pathological institute of the hospital. Inquiry was made in each case for a history of scarlet fever, rheumatic fever, and family renal disease. Dates are relative to time of the first examination, which was a complete medical one, including examination of the fundi. In these abstracts, negative and normal findings have been omitted.

CASE 1.—Man aged 31, motor mechanic; 3½ months in hospital: discharged, no improvement. History: Six months ago sore-throat; five months ago pains in abdomen and back, fever, and nose bleeding; four months ago pains in both groins, headache, and swelling of feet which has continued intermittently since, in spite of two months in bed. Previously syphilis, 2½ years ago, treated regularly to date of present illness. First examination: Œdema only of lumbar pads; no cardiac enlargement; B.P. 134/70; proteinuria; hæmaturia. Course: Hæmaturia disappeared in ten days; œdema gradually increased; proteinuria increased from 7–14 g. per day to 18 g. Investigations: Blood-urea 0·028 g. per 100 c.cm. a week after admission; 0·054 g. two weeks before discharge. Standard clearance 119 per cent. normal one week after

admission; 101 per cent. normal two weeks before discharge. Plasma proteins 4·55 per cent.

Clinical diagnosis: Chronic diffuse nephritis (intermediate stage).

CASE 2.—Woman aged 22, labeller; 3½ weeks in hospital; discharged; seen one month later, no improvement. History: One year ago illness lasting three weeks; misty vision, swelling of limbs, body, and face, anuria for two days, followed by hæmaturia; nine months ago, headaches and slight shortness of breath; one month ago, nausea, occasional vomiting; two weeks ago, swelling of ankles. Previously, six years ago, tonsillectomy for sore-throat; mother died of renal disease. First examination: No œdema; apex-beat fifth space, ½ in. outside N.L.; B.P. 150/100; proteinuria; hæmaturia. Course: No significant change in condition; headaches and swelling recurred in first month after leaving hospital. Investigations: Blood-urea 0·027 g. per 100 c.cm. Standard urea clearance 46 per cent. normal.

Clinical diagnosis: Chronic diffuse nephritis (intermediate stage).

CASE 3.—Aged 32, housewife, formerly teacher; one month in hospital; discharged, condition improved. History: One year intermittent swelling of face and feet; six months, headaches and occasional vomiting, occasional pain in left side of back, radiating to left flank; three months ago, increase in severity of symptoms and temporary frequency; one month ago, legs became swollen to top of thighs. Previously, scarlet fever at 15 years; three years ago, splenectomy for thrombocytopenic purpura; two years ago, cholecystectomy and appendicectomy. First examination: Gross œdema of legs, back, and face; apex-beat not felt; slight tenderness on pressure over region of left kidney; B.P. 130/80; proteinuria. Course: Four days after admission urine began to increase and œdema to disappear; lost 24 lb. in weight. Investigations: Blood-urea 0·03 g. per 100 c.cm. Standard clearance 32–44 per cent.; plasma proteins 3·9 g. per 100 c.cm.

Clinical diagnosis: Chronic diffuse nephritis (intermediate stage).

CASE 4.—Man aged 22, market porter; six weeks in hospital; died. P.M. History: Three weeks swelling of face and legs, headaches, frequency. First examination: Gross œdema, ascites, bilateral pleural effusions; apex-beat just external to nipple line; gums bleeding; B.P. 190/110; proteinuria. Course: General condition unchanged until four weeks after admission, when diuresis began two days after beginning of treatment with urea 20 g., t.d.s.; lost 10 kg. in 11 days. Six weeks after admission, died with clinical signs of bronchopneumonia. Investigations: Blood-urea 0·07 g. per 100 c.cm. on admission, 0·512 g. two days before death. Proteinuria 14–23 g. per day. Plasma proteins 3·55 per cent. Standard urea clearance 70–90 per cent. normal.

Clinical diagnosis: Chronic diffuse nephritis (intermediate stage).

Summary of necropsy (136/1933).—Great œdema and partial collapse of lungs. Bilateral pleural effusions (1064 c.cm. left, 887 c.cm. right). Ascites (946 c.cm.). Slight œdema of brain. Œdema, slight parenchymatous degeneration, and congestion with free iron in liver. Œdema of pancreas. Œdema and microscopic subacute inflammation of spleen. Slight cardiovascular hypertrophy. Moderate general atheroma. *Macroscopic appearance of kidneys:* Slightly enlarged kidneys with smooth, pinkish-buff subcapsular surfaces profusely flecked with lipoid. Pale yellowish-white cortex with straight, slightly blurred pattern, focal engorgement of vessels, and a few scattered lipoid flecks. Demarcation between cortex and medulla clear. *Microscopic appearance of kidneys:* As nephritis acris in intermediate stage (Russell [5]) (subacute lipoid nephritis).

CASE 5.—Man aged 31; three weeks in hospital; died. P.M. History: Eight months ago, swelling occurred, and headaches, which he had had for an indefinite period, became worse; four months ago, in St. Bartholomew's Hospital with same symptoms. Previously, appendicitis and peritonitis in London Hospital at 8 years old; two years ago, lobar pneumonia. First examination: Anæmia of mucous membranes; gross œdema and ascites; apex-beat not located; B.P. 160/110; bilateral pleural effusions; proteinuria. Course: Two weeks after admission patient complained of abdominal discomfort, and had high fever; bubbling râles in both lungs the day before death. Investigations: Blood-urea 0·048 g. per 100 c.cm. Standard clearance 30 per cent. normal. Plasma proteins 3·8 g. per 100 c.cm. Proteinuria 15–33 g. per day.

Clinical diagnosis: Chronic diffuse nephritis (intermediate stage).

Summary of necropsy (258/1933).—Great cardiovascular hypertrophy. Moderate general atheroma. Old hæmorrhages in brain and in meninges of brain and spinal cord. Hydronephrosis. Hypertrophy of bladder and of left ureter; no obstruction in urinary tract. Acute and chronic cystitis. Acute fibrinous pericarditis. Heart failure. Brown induration and œdema of lungs. Congestion of stomach and intestines. Mucous catarrh of stomach. Ascites (118 c.cm.). Bilateral pleural effusions (887 c.cm. right; 59 c.cm. left). Very great œdema of feet, legs and thighs, vulva and lumbar region. Œdema and central atrophy of liver without obvious congestion. Œdema of spleen and pancreas. Considerable external and slight internal hydrocephalus. *Macroscopic appearance of kidneys:* Great reduction in size of both kidneys, especially left, with grey subcapsular surfaces profusely studded with slightly raised yellowish-white pinhead areas and occasional flecks of lipoid. No visible pattern in œdematous, pinkish-grey cortex. Demarcation from medulla poor. Slight prominence of vessels. Slight enlargement of congested pelvis of right kidney (3 × 1·5 cm.). Hydronephrosis (3 × 2 cm.) of left pelvis involving lower half of kidney more than upper. No definite uretero-pelvic junction in left kidney. Slight thickening and dilatation of left ureter (1·3 cm. circumference). Right ureter thin-walled (1·5 cm. circumference). *Microscopic appearance of kidneys:* As nephritis repens, type 2 (Russell [5]) (chronic interstitial nephritis).

CASE 6.—Girl aged 11; four months in hospital; died one month later. P.M. History: Five months, attacks of headache and vomiting, puffiness under eyes; two weeks ago, "cold"; ten days ago, hæmaturia, slight nocturnal frequency. Previously, measles at three years, tonsillectomy at five years. Grandfather died of Bright's disease, father not strong and "gets puffy under his eyes," sister has renal rickets. First examination: Anæmia of mucous membranes; slight œdema of shins; apex-beat ½ in. external to nipple line; vessels easily palpable; B.P. 250/140; diminished movement and breath sounds at right lung base; fundi, choking of both discs, œdema of retina, veins congested, arteries narrow, areas of white exudate, especially in right macular region; proteinuria; hæmaturia. Course: Condition varied greatly; hypertensive cerebral attacks in which patient was comatose, with occasional fits, and had attacks of failing vision; death occurred one month after discharge. Investigations: Blood-urea 0·067 g. per 100 c.cm. on admission, 0·130 g. on discharge. Standard clearance 20 per cent. normal.

Clinical diagnosis: Chronic insidious nephritis (terminal stage).

Summary of necropsy (280/1933).—Broncho-pneumonia. Congestion of trachea and bronchi. Œdema of lungs. Pleural effusions (85 c.cm. right; 55 c.cm. left). Ascites (1477 c.cm.). Œdema of pancreas. Œdema of stomach and jejunum. Moderate pitting œdema of legs and ankles. Slight cardiovascular hypertrophy. Very slight general atheroma. Fibrous pleural adhesions over lower lobe of left lung. Obsolete tuberculosis of bronchial lymph gland in upper part of hilum of left lung. Severe parenchymatous degeneration of liver. Acute inflammation of spleen. *Macroscopic appearance of kidneys:* Slightly enlarged kidneys with pale yellow, faintly lipoid-flecked, smooth subcapsular surfaces; broad pale yellow cortex with very blurred but mostly straight pattern and distinct grey glomeruli. *Microscopic appearance of kidneys:* As nephritis acris in late intermediate stage (Russell [5]) (subacute lipoid nephritis).

CASE 7.—Woman aged 27; four months in hospital; discharged; condition improved; seen eight months later. History: Ten days, epigastric pain, nausea, vomiting, frequency, dysuria; three days, blurred vision.

First examination: Six months pregnant; œdema of ankles; apex-beat 1 in. external to nipple line; B.P. 215/130; fundi, R and L, neuroretinitis, hollow detachment of each retina in lower part; proteinuria; hæmaturia. Course: Two days after admission, abortion induced; macerated fœtus; B.P. fell to 175/125 on same day and subsequently decreased to 150/100; condition improved; disturbances of vision disappeared; papilloedema persisted; apex-beat on discharge ¾ in. outside N.L. Eight months later, no symptoms, proteinuria, hæmaturia, B.P. 160/110. Investigations: Blood-urea 0·114 g. per 100 c.cm. Standard urea clearance 15 per cent. normal on admission; 16 days after abortion, blood-urea 0·034 per cent., standard urea clearance 30 per cent. normal; proteinuria 2–6 g. per day.

Clinical diagnosis: Chronic nephritis (intermediate stage).

CASE 8.—Boy aged 16, plumber's mate, welds junctions of lead pipes; five months in hospital; condition unchanged. History: One month, swelling. Previously, nasal obstruction for last three years; three months ago, sore-throat and shivering causing one week's illness. First examination: Mouth-breather; nasal obstructions; small red tonsils; an anæmia of mucous membranes; œdema of face, lumbar pads, and shins; apex-beat internal to nipple line; B.P. 115/80; percussion note impaired at bases of both lungs; proteinuria. Course: Œdema continued to time of discharge, being only temporarily affected by diuretics; tonsillectomy had no apparent effect on the renal condition. Investigations: Blood-urea 0·042 g. per 100 c.cm. on admission, 0·048 g. on discharge. Standard urea clearance 100 per cent. normal; plasma proteins 4 g. per 100 c.cm.; proteinuria 7–17 g. per day.

Clinical diagnosis: Chronic nephritis (intermediate stage).

CASE 9.—Man aged 29, french polisher; 4½ months in hospital; discharged; condition improved; seen 15 months later. History: Four months, swelling of face and feet, headaches, feelings of fullness, frequency. Previously 11, 8, and 4 years ago, attacks of gonorrhœa, each treated at London Hospital; one year ago, syphilis, diagnosed at London Hospital, treated at Whitechapel V.D. clinic; until seven months ago was in habit of drinking two gallons of beer per day. First examination: Gross œdema of legs, body, and face; ascites; enlarged cervical lymph glands; apex-beat in nipple line; arteries slightly thickened and very easily palpable; B.P. 175/110; dullness and diminished breath sounds at bases of both lungs; proteinuria; hæmaturia. Course: Œdema disappeared and general condition improved; 15 months after discharge, occasional swellings; B.P. 135/80; proteinuria. Investigations: Blood-urea 0·027 g. per 100 c.cm. on admission, 0·033 g. 15 months after discharge. Standard urea clearance 60 per cent. normal; plasma proteins 4 g. per 100 c.cm.; Wassermann reaction (blood), twice negative.

Clinical diagnosis: Chronic nephritis (intermediate stage).

CASE 10.—Woman aged 71; 1½ months in hospital; condition improved; seen two months later. History: Three months, swelling of legs in evenings and occasional nocturnal frequency; hæmaturia for few days; occasional pain in left loin. Previously, three years ago, diarrhœa, vomiting, loss of appetite, in London Hospital, diagnosed as chronic pancreatitis; one year ago in the hospital with rheumatoid arthritis, of sudden onset following pneumonia (urine then contained a trace of albumin and grew *B. coli* on culture). First examination: Anæmia of mucous membranes; gross œdema of legs and back; apex-beat 1 in. external to nipple line; arteries not unduly thickened for age; B.P. 140/90; impaired percussion note and breath sounds over both bases; proteinuria. Course: Œdema disappeared; proteinuria decreased; B.P. fell to 100/50. Two months after discharge, slight œdema of legs. Investigations: Blood-urea 0·045 g. per 100 c.cm. Standard clearance 50 per cent. normal; plasma proteins 5 g. per 100 c.cm.

Clinical diagnosis: Amyloid nephrosis.

I wish to thank Prof. Arthur Ellis for his valuable advice and criticism, and Dr. Dorothy Russell for the special post-mortem reports. I am also grateful to the ward sisters, Miss Dalby and Miss Grassi, for their willing coöperation, and to Mr. R. H. Ruse for technical assistance.

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POTENT FORMOL TOXOID AS A DIPHTHERIA PROPHYLACTIC

AND THE INTERPRETATION OF THE MOLONEY TEST

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Toxoid-antitoxin mixture (T.A.M.) has been much used during the past decade. In 1923 O'Brien and his colleagues [1] found that 85 to 98 per cent. of a group of Schick-positive city children became Schick-negative within three months of immunisation with the routine three doses of T.A.M. Harries [2] in Birmingham and Benson [3] in Edinburgh showed that by immunising nurses and giving further injections to the small proportion still Schick-positive after the routine immunisation, it was possible virtually to eradicate diphtheria from hospital staffs, and O'Brien and his colleagues [4] showed that this was true of residential schools. But all these workers found a proportion positive after the routine three injections. It is difficult in an ordinary anti-diphtheria campaign to find these persisting Schick-positive children and reinoculate them. It was on general considerations of this kind that the conference of experts, held under the auspices of the League of Nations,[5] recommended that more active materials should be used for immunisation. Nevertheless, certain writers maintain their allegiance to T.A.M., and in many areas the results appear to be satisfactory.

Experience in Leeds has been less happy. For example, in one group of 549 children upon whom a final Schick test was performed about six months after the final injection of T.A.M., 138 (25 per cent.) gave a positive result.[6] Since a large proportion of these children were below the age of 7 years and had not been submitted to a preliminary Schick test before immunisation, it is certain that some at least of them were Schick-negative before the treatment was carried out, and consequently that the true proportion of positives on retesting was actually higher than 25 per cent. In one group of 105 children between the ages of 5 and 7 years, 46 per cent. were positive when tested seven months after the third injection. Similar results have been reported from other cities. In Bristol 42 per cent. were still positive after immunisation; and in Cork Saunders [7] reported 23 per cent. of children as still positive six months after the third injection. Such results are certain to bring discredit on any scheme of immunisation, and it was in an attempt to obviate this that the investigation which is here described was undertaken. I personally carried out the testing and immunisation of every case, so that the fallacies associated with groups of workers do not arise. The investigation is being continued and extended, and this paper is in the nature of a preliminary report.

A good prophylactic should induce rapidly a lasting immunity, and this end should be attained with a minimum of unpleasant reactions. Toxoid has long been known as an efficient antigen, but its use was largely restricted by the fact that it was liable to give rise to severe reactions, especially in older children and adults. Recently O'Brien and Parish [8] published observations on the efficiency of formol toxoids of high antigenic value, and Parish [9] extended the work to children suffering from surgical tuberculosis. The following investigation deals with the efficiency of unconcentrated formol toxoids—of much higher immunising value than those generally used—tested on a population which is difficult to immunise, and in which the natural immunity-rate is low.

Some idea of this immunity-rate will be gained from a study of Table I., which gives the results of the primary Schick tests in 905 children.

TABLE I

Age.	Tested.	Negative.	Positive.			Immunity-rate per cent.
			Slt.	Mod.	Mkd.	
Under 7 years ..	709	86	75	418	130	12·1
7 years and over..	196	59	24	88	25	30·1
All ages (to 14) ..	905	145	99	506	155	16·0

Of the 196 children over 7 years, 135 were below the age of 9 years, and the oldest child was aged 14 years. All the Schick tests were read on the second and also on the seventh day.

This low degree of natural immunity is possibly in some way associated with the high incidence in the community of the *Bacillus diphtheriæ* gravis, described in Leeds in 1931 by Anderson, McLeod, and their co-workers.[10] It is perhaps significant that in Hull, in which city the gravis type of organism is also very prevalent,[11] the natural immunity-rate in a series of 368 children was only 29 per cent.—which is described by Graham Forbes as being "low." [12]

RESULTS OF MOLONEY TESTS

The Moloney test, introduced by Moloney and Fraser [13] in 1927, which consists essentially of a skin test performed with a minute amount of toxoid, is supposed to indicate by a positive reaction those children who are likely to show symptoms of some severity on the injection of larger doses of toxoid. In America the test is employed in conjunction with the toxoid of low Lf value which is used there; and O'Brien and Parish [8] claim that it also acts with toxoids of much higher value. Table II. gives the Moloney test results as performed on 905 children, aged 9 months to 14 years. All the results were read 48 hours after the test injection, and the results were recorded as follows: (1) "definite reaction" (M+ + +): a large area of erythema, up to 40 mm. or more in diameter, with a definite palpable area of induration in the centre; (2) "mild reaction" (M+ +): an area of erythema of more than 10 mm. in diameter, with an area of slight induration; (3) "faint reaction" (M+): a definite area of erythema of less than 10 mm. in diameter, without induration, *or any area of a faint pink colour which showed no thickening, and which was not due to trauma.* The words in italics will be referred to later.

The number of positive cases was therefore 77, or 8·5 per cent. of the total cases. From the Table it will be seen that the positive Moloney reactors were over four times more frequent in the Schick-negative than in the Schick-positive group. Yet the number of M-reactors in the Schick-positive group would hardly warrant the procedure advocated by some writers—viz., the leaving of these cases un-immunised.

TABLE II

Schick result.		Moloney result.			
		Negative.	Positive.		
			Faint (M+).	Mild (M+ +).	Definite (M+ + +).
Positive ..	760	718	24	12	6
Negative ..	145	110	18	8	9
Totals ..	905	828	42	20	15

IMMUNISATION WITH FORMOL TOXOID (FT)

Through the courtesy of Dr. R. A. O'Brien, director of the Wellcome Physiological Research Laboratories, I have been enabled to use toxoids (FT) of high antigenic value in the immunisation of these cases These toxoids had Lf values varying from 20 to 28 units per c.cm. (More recent groups have been treated with a toxoid of Lf 53, but these figures are not included in this paper.) This communication deals with 450 cases in which immunisation with FT has been completed. (Many of the S+ M+ cases were immunised with T.A.F., with which the development of immunity was slower; these cases are not included in this report.) The first 33 cases were treated with repeated small experimental doses of FT, and these results are also omitted from the following account. Of the remaining cases, the majority received three doses of FT, each of 1 c.cm., at fortnightly intervals, though 49 had three graded doses. All injections were given intramuscularly in the lateral aspect of the thigh. Final Schick tests were carried out at varying intervals after the third injection, and in testing a Schick control with heated toxin was done in each case. Table III. shows the results obtained in certain groups of cases.

TABLE III

Interval.*	Lf units per case.	Tested.	Negative.	Per cent. negative.
4	60	144	121	84
4	78	25	24	96
7	70	20	18	90
7	76	20	19	95
7	72	18	18	100
8	72	56	56	100
9	55	17	16	94

* Interval in weeks between third dose and final Schick test.

TABLE IV

Interval.*	Cases tested.	Schick-negative.	Per cent. negative.
4 and under ..	179	154	86
5–8	127	120	95
9–12	42	39	93
Summary ..	348	313	90

* See note to Table III.

Owing to intercurrent illness, accidents, removal to other homes, holidays, and other reasons, it was found impossible to induce all the cases to present themselves for the final test at the time desired. So far 348 cases have had the final Schick test, and the complete results are summarised in Table IV. There is little

doubt that most of the cases which appear in the negative column of the 9–12 weeks group would have been negative if circumstances had permitted of earlier testing. (Cases which were positive at the final Schick test have since been immunised by a further dose of FT, and the result confirmed by a further Schick test.)

For the purpose of confirming the results of the final Schick tests, antitoxin titration, independent of knowledge of the clinical features of the cases, was carried out at the Wellcome Laboratories on the sera of about half of the positive reactors; the titration results agreed with the clinical findings in every case.

REACTIONS: SIGNIFICANCE OF THE MOLONEY TEST

Some reaction, however slight, after an immunising dose of toxoid, was found in 14 of the 450 cases with which this paper deals. In 12 of these cases the reaction was general, but was nearly always mild, and consisted mainly of malaise, loss of appetite, slight loss of sleep, and sometimes slight nausea and vomiting. These symptoms were always transient. In two of these cases there was also slight transient redness at the injection site.

Certain of these cases had an M-negative reaction according to the current interpretation of the test; but they had shown an area of redness less than 10 mm. in diameter. Hence, after consideration and experiment, the definition of the "faint reaction" (M+) which is given earlier in this paper was adopted. Further, contrary to the usual practice, all the Moloney reactions were read, not only at 48 hours, but also on the seventh day. Of 586 cases in which information regarding the response to the injection of FT is available, seven showed an "M-delayed" reaction on the seventh day. Two of these gave positive Schick reactions, and on immunisation with FT both showed unpleasant symptoms; the other five cases all gave negative Schick reactions, and were therefore not immunised

It would seem that the Moloney test is not generally interpreted sufficiently strictly, at least when toxoids of high Lf are used, and that, in order to ensure absence of symptoms after immunising doses of toxoid, it is necessary to exclude not only those cases who show any skin reaction, even under 10 mm. in diameter and without induration, but also those cases which exhibit the "delayed reaction" which is described above.

So far only one case of clinical diphtheria has been notified amongst these children. The patient developed the disease a month after the third injection, and two days after the final Schick test was performed. This test was definitely positive when read in hospital on the seventh day, and active immunity had therefore not developed completely at the time of infection. The condition was mild and cleared rapidly.

The reactions following injection of FT and the significance of the Moloney test will be discussed more fully in a later communication.

SUMMARY

(1) Formol toxoids of Lf 20 and upwards per cubic centimetre were tested on a child population in which the natural immunity to diphtheria is very low. (2) Generally, three doses of toxoid, each of 1 c.cm., were given at fortnightly intervals, the average amount of FT per case varying from 55 to 78 Lf units. The induction of immunity was rapid; 84 to 96 per cent. of the various groups of children were Schick-negative within four weeks, and 90 to 100 per cent. within eight weeks. (3) Individuals who are likely to react unfavourably to injection with toxoids of these values can usually be picked out by the Moloney test. A positive Moloney reaction should, however, be interpreted more strictly to mean any reaction at all of an inflammatory nature at the injection site, when read at 48 hours. An "M-delayed" reaction is also described; it is suggested that it is of some significance. (4) Few cases showed unpleasant symptoms after the injection of FT. These symptoms were transient and mild in nature.

It is a pleasure to express my great indebtedness to Dr. R. A. O'Brien, of the Wellcome Research Laboratories, not only for his kindness in supplying the materials used, but also for his advice and for his interest in the progress of the investigation.

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SEVERE RELAPSING ANÆMIA IN A CASE APPARENTLY OF HODGKIN'S DISEASE

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WE regard the following case as almost certainly one of lymphogranulomatosis maligna (Hodgkin's disease), because the disease commenced at the age of about 7 years with enlargement of lymphatic glands on one side of the neck and, though at the age of 21 years, after radium treatment, all obvious clinical signs had disappeared, excepting severe anæmia, nevertheless at the necropsy, one and a half years later, a mass of enlarged retroperitoneal glands was discovered. There was no evidence clinically or at the post-mortem examination of any tuberculosis or leukæmia, and though typical Sternberg features were absent, as far as our microscopic examination went, we think that we are justified in regarding the changes in the retroperitoneal glands as representing the remains of lymphogranulomatosis maligna.

The severe relapsing anæmia was certainly not typically aplastic in character, but was in great part hæmolytic. At one time, after a series of blood transfusions followed by other treatment, the patient left the hospital (Feb. 6th, 1933) apparently cured not only of his lymphatic glandular disease, but also of his anæmia. Nevertheless he had to be readmitted, eight months later, with progressive anæmia, which would not yield to treatment. The bone-marrow at the necropsy was found to be red and cellular, free from fat, and containing abundant erythroblasts.

CLINICAL HISTORY

The patient was first admitted to the German Hospital in February, 1930, when he was 19 years old, with some enlargement of lymph glands on both sides of the neck

and in both axillæ. By radiographic examination there seemed likewise to be considerable enlargement of lymph glands in the upper mediastinum. The liver was not felt, but the spleen reached one finger-breadth below the ribs. The Pirquet cuti-reaction was negative. The temperature remained below 100° F. Fractional examination of the gastric juice showed nothing abnormal. The blood count (Feb. 27th, 1930) was as follows:—

Erythrocytes	2,280,000	Eosinophils	8%
Leucocytes	13,050	Metamyelocytes	5%
Hæmoglobin	43%	Polymorphonuclears	35%
Colour-index	0·94	Lymphocytes	40%
		Plasma cells	1%
		Monocytes	11%

Two nucleated red cells (both normoblasts) seen during the differential count of 100 leucocytes.

The disease appeared to have begun with enlargement of the lymph glands on the left side of the neck when the patient was about 7 years of age. These glands were excised when he was 8 years old, and about four months later he had glandular enlargement on both sides of the neck. At that time tuberculosis seems to have been suspected.

Arsacetin treatment commenced in February, 1930, led to an improvement in the blood picture, but was followed by jaundice, which largely disappeared by April. There was then often slight fever. In April, 1930, radium treatment at the Radium Institute was commenced, and was followed by improvement in the boy's general health. In March, 1931, however, he was said not to look well, though he was at work. There was no evidence of enlarged lymphatic glands anywhere and the spleen could not be felt.

On April 28th, 1932, he collapsed in the street and was brought to the German Hospital, where he was readmitted. There was no enlargement of any superficial lymph glands or of the spleen or liver. Brachial blood pressure: 110/60 mm. Hg. The blood-serum gave negative Wassermann and Meinicke reactions. The Pirquet cuti-reaction was again negative. The urine contained a trace of albumin, with a few leucocytes and (very few) erythrocytes. The fæces were examined for ova of intestinal parasites, with negative results. For the first two days after patient's readmission there was slight fever, but then there was none. The blood count (May 17th, 1932) showed:—

Erythrocytes	4,300,000	Basophils	1%
Leucocytes	11,600	Eosinophils	7%
Thrombocytes	400,000	Polymorphonuclears	48%
Hb.	80%	Lymphocytes	34%
C.I.	1·0	Monocytes	10%

On May 25th, 1932, he left the hospital, but he had to be readmitted on Sept. 20th after fresh radium treatment at the Radium Institute. The report was that there were no signs of Hodgkin's disease excepting the slightest remnant in the thorax, but unfortunately the patient had become extremely anæmic. On readmission besides the anæmia there was slight jaundice; though the patient was very weak he seemed to feel comfortable and could read in bed. Temperature (in the afternoon), 99·2° F.; pulse, 120; respiration natural. Brachial blood pressure, 120/70 mm. Hg. The urine showed nothing abnormal excepting a slight excess of urobilinogen. No gastric achlorhydria. No enlargement of superficial lymph glands; the liver and spleen could not be palpated, but the spleen seemed slightly enlarged by percussion. Blood count (Sept. 21st, 1932):—

Erythrocytes	1,220,000	Basophils	1%
Leucocytes	11,800	Eosinophils	4%
Hb.	25%	Myelocytes	2%
C.I.	1·024	Metamyelocytes	1%
		Polymorphonuclears	67%
		Lymphocytes	22%
		Monocytes	3%

Megalocytosis, anisocytosis, poikilocytosis. One megaloblast and one normoblast seen among 100 leucocytes.

The blood-serum was deep yellow and clear, and gave a negative direct and a strongly positive indirect Hijmans van den Bergh reaction.

The patient was given several blood transfusions up to Oct. 21st (the jaundice had almost disappeared by that time), but he continued to improve without blood transfusion, till on Dec. 5th his blood count gave: hæmoglobin, 75 per cent.; erythrocytes, 4,200,000. Then he had slight fever and became more anæmic. The fever ceased after Dec. 12th. With a liver extract, Hepatopeon, as the main treatment, the blood count on Feb. 6th, 1933, when the patient left the hospital, gave:—

Erythrocytes	4,600,000	Basophils	2%
Leucocytes	7,950	Eosinophils (due to liver preparation)	18%
Hb.	88%	Polymorphonuclears	48%
C.I.	0·95	Lymphocytes	24%
		Monocytes	8%

No nucleated red cells; erythrocyte picture normal.

In the out-patient department on April 3rd the blood count gave: hæmoglobin, 94 per cent.; erythrocytes, 4,660,000. The patient about this time seemed to have recovered, and what radiographically in February might have been an enlarged lymphatic gland at the hilum of the right lung was not noted in the radiologist's report of June, 1933.

The patient was, however, readmitted early in October, 1933, with considerable anæmia. Blood count (Oct. 6th):

Erythrocytes	2,080,000	Eosinophils	4%
Leucocytes	11,100	Polymorphonuclears	72%
Hb.	49%	Lymphocytes	19%
C.I.	1·18	Monocytes	5%

Blood transfusion, &c., seemed no longer to help. The spleen (Oct. 23rd) could be felt during inspiration half an inch below the costal margin, and there was occasionally slight fever (between 99° and 100° F.) in the afternoons. On Nov. 15th a complete blood count gave:—

Erythrocytes	1,100,000	Eosinophils	4%
Leucocytes	8,300	Myelocytes	1%
Thrombocytes	180,000	Polymorphonuclears	60%
Hb.	24%	Lymphocytes	25%
C.I.	1·1	Monocytes	10%

Megalocytosis; moderate poikilocytosis, anisocytosis, and polychromasia. One normoblast and one megaloblast were counted to 100 leucocytes. Resistance of the erythrocytes towards graduated hypotonic sodium chloride solutions: hæmolysis commenced with the 0·46 per cent. solution (that is, within normal limits).

At the latter part of November the patient developed moderate pyrexia and his tonsils were enlarged. The anæmia further increased and he died on Dec. 2nd, 1933, the temperature reaching 106° F. shortly before his death.

NECROPSY

Pale, not jaundiced, not very emaciated body. No superficial or visceral hæmorrhages found. By ordinary inspection of the body there was no obvious enlargement of any superficial lymph glands, but during the necropsy slight enlargement was noted of the glands in the supraclavicular region and lower part of the neck on both sides and in the right axilla; also of the glands at the roots of the lungs. There was a conglomerate packet of retroperitoneal glands in front of the middle portion of the abdominal aorta about the size of a small orange; to this we will return further on. All these enlarged lymph glands were pale on section.

There was some pleuritic effusion at the base of the right lung. The liver (2250 g.) had a somewhat "nutmeggy" appearance by macroscopic examination; by microscopic examination there was a little centro-acinous necrosis, and also a slight cellular interacinous infiltration here and there, suggesting an early cirrhotic change. The spleen (950 g.) was enlarged, of rather soft consistence, and in its red substance there were some pale patches which microscopically were necrotic. The pulp was enlarged in regard to the relatively small Malpighian follicles; it was engorged with blood and partly infiltrated with mononuclear ("lymphosarcoma-like") cells, some with relatively large nuclei. The kidneys (together 260 g.) showed nothing special to naked-eye examination, but microscopically there was some cloudy swelling of the convoluted tubules, with a little patchy small cell infiltration suggesting very early "chronic interstitial nephritis." The brain and the other viscera showed nothing special. The bone-marrow of the sternum and the middle of the shaft of the right femur were examined and found to be deep red.

FURTHER MICROSCOPIC EXAMINATION

A piece of the red bone-marrow from the middle of the shaft of the femur was found to be free from fat. Amongst the marrow cells were scattered megakaryocytes and

abundant erythroblasts. Many of the latter showed small pyknotic and sometimes fragmentary nuclei. These erythroblasts are well shown in the accompanying (high-power) microphotograph (see Figure), kindly taken for us by

High-power photograph of bone-marrow. (× about 500.)

Dr. W. Gilges. The lymph glands from the retroperitoneal mass showed slight fibrosis and infiltration with mononuclear ("lymphosarcoma-like") cells, some with relatively large nuclei; Flemming's germ centres were indistinct; no necrosis was seen. Though in the piece microscopically examined there were no typically Sternberg features, there can hardly be a doubt that this retroperitoneal mass represented a remnant of true lymphogranulomatosis maligna (Hodgkin's disease). The spleen, as stated at the commencement of the paper, showed somewhat similar changes, though the pale patches were necrotic. Some interacinous lymphocytes in the liver certainly did not suggest leukæmia, and nowhere were any changes discovered suggestive of any kind of leukæmia or tuberculosis. Sections of the liver and spleen showed considerable Prussian-blue reaction for free iron.

We think, therefore, as we have already explained, that we are justified in regarding the case as an atypical one of lymphogranulomatosis maligna (Hodgkin's disease), modified by radium treatment. It should be specially noted that considerable anæmia was present before the commencement of the radium treatment. The later severe anæmia was largely hæmolytic in nature, as shown by the Hijmans van den Bergh reaction in the blood-serum and the red blood picture during life, and by the hyperplastic bone-marrow and the free iron in the liver and spleen after death. It must not, however, be forgotten that in some cases of clinically more or less aplastic anæmia the bone-marrow may be hyperplastic.[1]

Postscript.—After correcting the proof of this paper we came across the account of three cases of a macrocytic hæmolytic type of anæmia in Hodgkin's disease, by Prof. L. S. P. Davidson, in the *Quarterly Journal of Medicine* (1932, xxv., 543; the first three of the nine cases described).

[1] See, for instance, Thompson, Richter, and Edsall: Amer. Jour. Med. Sci., 1934, clxxxvii., 77.

MEDICAL SOCIETIES

TUBERCULOSIS ASSOCIATION

THE provincial meeting of this association was held at Cambridge, March 22nd to 24th. At the first session a discussion on

Allergy in Tuberculosis

was opened by Prof. LYLE CUMMINS. The use of the term allergy had, he said, unfortunately in some quarters come to be restricted to that manifestation of it which was the most easily elicited and appraised—the inflammatory reaction to inoculation of antigens like tuberculin in the infected animal or man. And since both the hypersensitive state and the relatively immune state were easily proved to follow upon and to depend on infection, it had come to be assumed by many that the presence of hypersensibility, loosely called allergy, implied the presence of immunity also. Thus had arisen a tendency to find in hypersensitivity to tuberculin a measure of immunity. That this conception was erroneous was shown both by the almost complete absence of any sign of immunity in the fulminating tuberculosis of young African gold miners who had proved a few months previously to be inordinately hypersensitive to tuberculin, and by the work of A. R. Rich and his colleagues who had shown that a completely desensitised animal might still remain immune.

Man in his responses to tuberculous infection might exhibit successively three main constitutional states: indifference, intolerance, and tolerance. The state of indifference was pre-allergic. First infection encountered no immediate response except that of natural immunity. The states of intolerance and tolerance depended on the acquired character of "allergy"; and reinfections, whether autogenous or exogenous, excited reaction. Allergy, or Pirquet's "altered reactivity," manifested itself in tuberculosis in a series of states which, although tending to overlap and interact, might be roughly subdivided as: (1) *Allergic hypersensitivity*: toxic and inflammatory processes excited by products of the action of antibodies on tuberculo-proteids, and resulting in exudative phenomena. (2) *Immuno-allergy*, an antitoxic stage, evoked, at least in part, by exposure to the toxic products of the hypersensitive state, and resulting in a diminution or cessation of inflammatory and exudative phenomena. (3) *Augmentation of natural immunity*, probably stimulated by the phosphatide and other lipoid constituents of the tubercle bacillus; and resulting in productive phenomena around infective foci—cellular proliferation, fibrosis, and calcification of spontaneous healing. There seemed reason to believe that the toxic and inflammatory effects of allergic hypersensitivity were inimical to the initiation of the "productive" changes of the immune phase. The latter could only become established if and when the toxic process had been suppressed or neutralised by the onset of the intermediate processes of immuno-allergy. The aim of treatment should be: the prevention or diminution of auto-inoculations by rest, local or general; control of hypersensitivity by desensitisation; and attempts at "immunisation" by appropriate auto-inoculations, or, in suitable cases, by tuberculin therapy.

Dr. R. C. WINGFIELD defined tuberculo-allergy as an acquired specific sensitiveness of the body cells to an antigen that was produced by the tubercle bacillus. It was now certain that it was the protein portion alone of the bacillus which produced allergy in the unallergic body and which could elicit allergic responses in the allergic body. The question as to whether allergy was a function of immunity and whether or not it was protective was still unanswered. It was certainly the response of the body to a foreign

protein, and probably a normal degree of allergy was protective and beneficial, but hypo- or hyper-allergy, being abnormal, might well be harmful. The very great differences in response to infection by the tubercle bacillus in the different races of men depended largely on the length of time of their racial experience of tuberculous infection. The shorter the racial experience the more acute the response. Was it not possible that a prolonged racial experience of tuberculous infection might breed a generation which was relatively immune to the protein portion of the bacillus, and therefore relatively hypo-allergic, but which had developed much less or no immunity to the lesion-producing non-antibody-forming lipin portion? Could not this explain the acute disease of the primitive, the semi-acute disease of the recently civilised, such as the South African and American negro, the chronic disease of the European, and the almost inert though grossly destructive tuberculosis of the Chinaman with his ancient civilisation?

Dr. F. G. CHANDLER remarked that A. R. Rich [1] had shown (*a*) that allergy was not synonymous with or essential to immunity. Immunity could be established without a concomitant development of allergy; and also (*b*) when an animal was rendered both allergic and immune, allergy could be abolished by desensitisation, leaving immunity unchanged and unweakened. Allergy was by no means constant in tuberculosis, and therefore tuberculin tests would seem to be too capricious to serve as a practical measure of diagnosis. On two separate occasions he had had a Mantoux test of all his cases of every type of heart and lung disease at the Chest Hospital, with the most variable and capricious results. Sensitiveness to tuberculin might exist where there was no evidence whatever of clinical tuberculosis or even of a tuberculous focus anywhere. Another point was that desensitisation did not ameliorate or cure. He had succeeded more than once in what appeared to be a complete desensitisation of the patient with no demonstrable effect on the clinical course of the disease. In conclusion Dr. Chandler said that if allergy was beneficial it should be encouraged; if harmful, they should seek to abolish it. It would be of great practical importance if incontrovertible evidence could be adduced to show that desensitisation in a series of cases had favourably affected the course of the disease.

Dr. CHARLES WILCOCKS said that in Tanganyika Territory the proportion of the general population giving allergic evidence of infection was about 50 per cent., excluding any case which showed signs or symptoms of tuberculosis. By "allergy" he meant no more than a condition of the tissues which resulted in an inflammatory response to the introduction of tuberculin into the skin. The tests demonstrated that a very large proportion of the population had met and so far kept in check the invasion of the tubercle bacillus. On the whole he thought that the African natives showed less resistance to the tubercle bacillus than ourselves, but that the majority of those who encountered it did so without apparent impairment of health. There was also reason to think that the natives responded to the introduction of tuberculin into the skin somewhat differently from the white races, vesiculation being common at the site of the test. The South African report considered that the less the tuberculo-allergy, the greater the ability to resist effective infection.

Dr. G. H. ORIEL, after describing some recent work on allergy in general, said that it was reasonable to suppose that the living tubercle bacillus in man might so affect the tissues that they were altered in chemical structure and so become to the host what was in effect a foreign protein which might act as an antigen giving rise to sensitisation. There were therefore three factors to be considered: (1) the toxic action of the tubercle bacillus and its products; (2) the allergic action of the tubercle bacillus itself; and (3) the possibility of altered tissue protein giving rise to allergy. An increase of non-heat-coagulable protein occurred in the urine in tuberculosis, indicating increased tissue breakdown, and this substance was capable of acting as an antigen. There was an enzyme-like action in the blood which acted on protein breakdown products but not on whole protein. It was suggested that the tuberculin reaction might depend on the liberation of toxin by sensitised tissue from neutralised toxin. Non-specific therapy, including the use of tuberculin, might depend on the liberation of protein breakdown products, which might increase the proteolytic action of blood and so prevent antigen reaching the tissues.

Dr. J. S. WESTWATER said the release of the bacillus protein gave rise to the allergic reaction. Allergy was the common property of infected individuals, reflecting in its variations the activity not of the infection but of the immunity. From clinical results in children it would seem that the higher degrees of allergy were associated with active resistance. Increase in allergy only occurred in cases responding to treatment. When resistance was overcome, allergy waned. Of the three factors in tuberculosis—infection, immunity, and allergy—infection was directly opposed to immunity; allergy was a property which might be inconvenient to the immunity mechanism. Clinical results would have to show whether it played a major or a minor rôle in the disease in man.

Blood Counts

At the second session a discussion on the value of blood counts in tuberculosis was opened by Dr. S. R. GLOYNE. There were, he said, many blood pictures in tuberculosis, just as there were diverse temperature curves; and all of them were an outward and visible sign of that intricate interplay of forces between infection and resistance which was constantly taking place in the body. They knew very little about the infection side of the picture. Tuberculosis was generally a long-drawn out chronic infection, and clinical pathologists had recorded random results at every stage of the disease, thereby making comparisons and controls very difficult. The differential leucocyte count was not a means of diagnosing tuberculosis; if it was of any use at all it was as a method of evaluation of the tissue damage which had resulted from infection. Furthermore, it was necessary always to bear in mind that tuberculosis as a disease was prone to secondary infections, and this might well alter the blood picture. There appeared also to be daily variations in the blood count of the normal individual which had to be taken into account, such variations occurring irrespective of food and reaching their maximum in the afternoon. The curve of the total neutrophil leucocytes closely followed the course of these tides and was largely responsible for their character. Thus even in the normal individual the blood count picture was not stationary for long, but the movements were small. In tuberculous subjects the oscillations were considerable, and these alterations occurring from time to time were believed by many observers to reflect the prognosis, the leucocytic picture in this respect being of more value than

[1] THE LANCET, 1933, ii. 520.

were physical signs and symptoms. They were now learning, however, to consider the blood picture as a whole. The physical, chemical, and serological parts of the picture were just as valuable as the cytological, and on the correlation of these various aspects of the whole picture their conception of infection and resistance must depend. The time factor—a relatively new conception in the clinical pathology of tuberculosis—was being taken into account, in other words prognosis rather than diagnosis, and to understand prognosis aright they must know the purpose for which these cells were called into being.

Papers on the subject were contributed by Dr. L. E. HOUGHTON and Dr. F. C. ROLES. Dr. Houghton described a simple formula or composite index of prognosis for each patient, based on the three criteria of sedimentation-rate, differential leucocyte count, and the Bonsdorff (a modified Arneth) count.

MEDICO-LEGAL SOCIETY

AT a meeting of this society on March 22nd, the chair was taken by Mr. ALBERT E. CREW, vice-president, and a paper on

Heart Disease in Workmen

was read by Mr. D. HARCOURT KITCHIN. He explained that when a workman with serious chronic heart disease not caused by his employment died at work, the courts nearly always treated the death as an accident arising out of the employment and awarded compensation. This situation was unjust to the employer, might be prejudicial to the workman, and was not what Parliament had intended in passing the Act. It had arisen through the operation of a system of case-law upon a statute which had been intended to be so simple in operation as not to need the intervention of lawyers. The industrious reporting of all workmen's compensation cases which came to the appellate tribunals had accumulated a large volume of judgments and dicta the effect of which was to confuse what should nearly always be a plain issue of fact.

He traced the sequence by which the present legal position had been reached. The Act, he said, laid down that the employer had to pay compensation when personal injury by accident arising out of and in the course of the employment was caused to a workman. In 1900, in the case of Hensey *v.* White, a workman with the vessels of his stomach weakened by chronic inflammation had ruptured them in straining at the fly-wheel of a gas-engine. The Court of Appeal had held that this was not an accident, because nothing "fortuitous or unexpected" had happened. The case of Roper *v.* Greenwood, in which a woman suffered uterine prolapse lifting heavy boxes, had shown that even severe and unusual strain might not constitute an accident. In 1903 both those decisions had been reversed by Fenton *v.* Thorley, in which the House of Lords had held that an injury could be caused by accident even though nothing fortuitous or external were involved if a workman injured himself by over-exertion. To hold otherwise, Lord McNaghten had said, would unfairly penalise a workman who put forth his best efforts. He had defined accident as "an unlooked-for mishap which is not expected or designed." This man had been healthy, but however diseased a workman was, it made no difference to the question of compensation.

The leading case of Clover, Clayton *v.* Hughes (1910), in which a workman had died of a ruptured aortic aneurysm, which might have burst in his sleep, while he had been performing some light operation, established the principle that if, broadly speaking, the work were shown to have contributed in any material degree to the death, compensation must be awarded. That case had been decided by a majority of three Lords of Appeal to two and was in many ways unsatisfactory; it was not a good foundation for the weight of the later decisions. The case of McFarlane *v.* Hutton Bros., in the Court of Appeal, showed that it made no difference to the question of accident whether a workman died as the result of some rupture of tissue or from a cessation of the heart's function, and that it was not necessary to point to any specific act or event as the cause of the injury.

In 1932 no less than four of these cases had been reported. In one the widow had failed because there was not sufficient evidence to connect the death with the work; Mr. Kitchin explained that if no one saw the workman actually fall the court would usually not draw the inference that the work had contributed. In James *v.* Partridge Jones,[1] where a "dipper" in a galvanising shop had died of angina pectoris during an interval in the work, the House of Lords had awarded compensation after a re-trial; the first judge had found as a fact that the work had not contributed, but the Court of Appeal had been dissatisfied and had sent the case back. In Treloar *v.* Falmouth Docks a stevedore had fallen dead when sitting on a sack during a rest period, just after he had lifted a hook above his head, and this death also had been held to be caused by accident arising out of the employment.

The Scottish courts would not take nearly such a wide view, but insisted that the widow should connect the death with some specific strain or occurrence. This view, however, seemed to be contradicted clearly by certain words of Lord Buckmaster in James's case. Mr. Kitchin concluded by pointing out the extreme importance of the medical evidence, by which alone it was possible to show that the work had contributed to the death, and which in the present state of diagnostic science must necessarily be largely speculative.

DISCUSSION

Mr. W. G. EARENGEY, LL.D., pointed out that the growth of the law on this subject had depended on the medical evidence, and to that extent responsibility rested on the doctor. Employers were chary of employing men who might become incapacitated and were, indeed, prevented from doing so by the insurance companies.

Dr. P. B. SPURGIN warned medical witnesses against arriving at conclusions unless they were absolutely certain. If they merely drew an inference, they should say so.

Dr. LETITIA FAIRFIELD said that, so far from the law following the medical evidence, it had taken the bit between its teeth and it did not matter what medical evidence was given. The Act should be regarded philosophically as an extension of widows' pensions.

Dr. A. S. MORLEY denied that insurance companies interfered with the employment of partially disabled men. Piecemeal legislation had ordained that a man with lumbago received half in insurance what a man with a strained back received in compensation, and

[1] See THE LANCET, 1933, i., 421.

the only persons who profited were the lawyers and medical examiners. A post-mortem examination should, he thought, be obligatory when compensation might be involved.

Dr. R. K. HOWAT considered that, although autopsies were desirable, they did not invariably reveal the cause of death. He did not think that medical examination by employers was at all general.

Dr. D. C. NORRIS said that Ford examined all his workpeople but did not reject any; they were graded according to their physical capacity.

Mr. KITCHIN, in reply, doubted whether the House of Commons would arrive at a better definition of accident if the House of Lords had failed. He said that Lord Atkin, when asked his opinion on these decisions, had justified them without hesitation as interpreting the intention of the legislature and remedying what had been considered a bad state of affairs brought about by the early decisions. His lordship would widen the concept of accident to include industrial disease.

EDINBURGH OBSTETRICAL SOCIETY

AT a meeting of this society on Feb. 14th, with Dr. OLIPHANT NICHOLSON, the president, in the chair, a paper on

Pyuria in the Puerperium

was read by Dr. DUGALD BAIRD (Glasgow). He began by saying infection of the urinary tract was commonly found after parturition. Thus gross infection of the urine developed in 79 out of 717 women whose urine was sterile before delivery (11 per cent.); the incidence was 5 per cent. after spontaneous delivery and 25 per cent. after complicated delivery. In a series of 3600 consecutive deliveries it was found that infection of the urinary tract accounted for about 12 per cent. of all cases of puerperal pyrexia. In about half of these the fever was due to exacerbation of chronic pyelitis of pregnancy or to continuation of an acute pyelitis of pregnancy; in the others it was attributable to infection of a tract which was sterile before delivery. Pyelitis arising from pre-existing infection appeared as a rule just after parturition and settled down quickly, whereas pyelitis primary in the puerperium usually came on later. It had been found that 17 per cent. of women after childbirth had residual urine, and this might be the source of an ascending infection.

In 36 cases the pyrexia was due to septicæmia (8 per cent. of all the cases of pyrexia), and in 18 of these the organism in the blood was coliform. In this latter group the urine usually became infected and the symptoms were those associated with puerperal pyelitis—viz., remittent fever, rigors in 56 per cent. of cases, urinary symptoms in 38 per cent. (usually very slight and of short duration), and abdominal discomfort and distension. Predisposing factors were difficult delivery and albuminuria of pregnancy. In 52 per cent. of cases the time of onset was before the third day and in 34 per cent. the eighth day or later. In over 50 per cent. of cases an organism identical with the one in the blood could be isolated from the fæces. It seemed likely that in most cases the organism spread to the vagina over the perineum and, by way of lacerations, to the blood. Stasis was rarely found in the ureters in these cases and the urinary infection which was produced cleared up quickly.

Blood Pressure and Posture

Dr. BARCLAY DICKSON read a paper in which he said that in the course of some observations on women in the later months of pregnancy it was noticed incidentally that when the patient was lying on her back the blood pressure was appreciably higher than when she was lying on her side. Thirty subjects had since been examined, nearly all of them being taken indiscriminately from the wards of a maternity hospital, but including two males; it had been found that the average difference in the systolic pressures was about 11 mm. Hg, and the difference in the diastolic pressures about 12 mm.—the pressure being in both cases lower with the patients on their side. The difference was observed whether pregnancy was present or not, and it could not be due solely to compression of the aorta by the pregnant uterus. It might perhaps be caused by stimulation of the sympathetic plexuses connected with the thoracic and abdominal arterial system by the weight of the viscera—a stimulation which would come into action only when the patient lay on her back. In this connexion it was noteworthy that nocturnal incontinence of urine and nocturnal emissions occurred mostly in the dorsal decubitus, and both had been prevented by sleeping on the side. The observations so far suggested that in hyperpiesis the "diastolic difference"—i.e., the difference between the back and side diastolic pressures—was very small; in one case quoted it was only 4 mm. Hg.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED MARCH 17TH, 1934

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 11 (last week 5); scarlet fever, 3063; diphtheria, 1348; enteric fever, 17; acute pneumonia (primary or influenzal), 1653; puerperal fever, 44; puerperal pyrexia, 114; cerebro-spinal fever, 22; acute polio myelitis, 4; encephalitis lethargica, 2; continue fever, 1 (Battersea); dysentery, 12; ophthalmi neonatorum, 95. No case of cholera, plague, or typhu fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on March 26th–27th was as follows: Small-pox, 16 under treatment, 0 under observation (last week 15 and 5 respectively); scarlet fever, 1729; diphtheria, 1815; enteric fever, 8; measles, 3470 (last week 3297); whooping-cough, 343; puerperal fever, 29 mothers (plus 9 babies); encephalitis lethargica, 260; poliomyelitis, 6; "other diseases," 109. At St. Margaret's Hospital there were 16 babies (plus 10 mothers) with ophthalmia neonatorum.

Deaths.—In 118 great towns, including London, there was no death from small-pox or enteric fever, 157 (52) from measles, 13 (1) from scarlet fever, 55 (17) from whooping-cough, 66 (16) from diphtheria, 42 (12) from diarrhœa and enteritis under two years, and 115 (38) from influenza. The figures in parentheses are those for London itself.

Fatal cases of influenza were widely distributed among 56 great towns, the highest number of deaths being reported from Birmingham 4, Liverpool, Sunderland, and Coventry each 3, no more than 2 from any other large town. There has been another slight rise in the weekly total of fatal cases which reached an earlier maximum of 109 in the week ending Jan. 6th, the figures for the last few weeks, working backwards, being as follows: 115, 99, 96, 85, 87, 73. The curve of the outbreak rather closely resembles that of 1931–32 (see THE LANCET, 1933, i., 393) although at a much lower level. The total deaths from influenza during the 11 weeks of the present year number 994, compared with 9930 during the corresponding period of 1933.

There were 14 fatal cases of measles in Liverpool, 9 in West Ham and in Leeds, 7 in Liverpool, 5 in Manchester and in Salford. Whooping-cough caused 12 deaths in Liverpool, 5 in Birmingham. Eight deaths from diphtheria were reported from Leeds, 4 from Liverpool, and 3 each from Huddersfield and Birmingham.

The number of stillbirths notified during the week was 310 (corresponding to a rate of 50 per 1000 total births), including 44 in London.

REVIEWS AND NOTICES OF BOOKS

Histology

By S. RAMÓN-CAJAL, M.D. Madrid, F.R.S. Lond., Director, Royal Cajal Institute for Medical Research; Emeritus Professor of Pathology, University of Madrid Faculty of Medicine. Revised by J. F. TELLO-MUÑOZ, M.D. Madrid, Professor of Pathology, University of Madrid. Authorised translation from the tenth Spanish edition by M. FERNÁN-NÚÑEZ, M.D. Madrid, Professor of Pathology, Marquette University Medical School. London: Baillière, Tindall and Cox. 1933. Pp. 738. 40*s*.

IN this country Cajal is known chiefly for his work on the histology of the central nervous system, and his contributions to our knowledge of the neuroglia and of the degenerations and regenerations of nerve-fibres are in constant demand as references. In Spanish-speaking countries his text-book on histology, now in its tenth edition, has for long been in use in the medical schools and has enjoyed a considerable popularity. It is now available for the first time in the English language and it is of interest to compare it with the better known of our own text-books on this subject. In the Spanish schools histology is taught upon somewhat different lines from those adopted by us. The student is given, in his first year, to quote from the preface to this book, a "thorough foundation in cytology, its history and philosophy. The normal histologic topography of the individual organs is then taken up along with the histopathology of the same during the second year." In accordance with this plan, which has much in its favour, the first seven chapters are devoted to a general consideration of the cell, its structure, physiology, and evolution. Numerous examples are quoted from lower forms in the animal scale, and this makes a good link with the training already received by the student in biology. The remainder of the book is devoted to a description of the various tissues. The part dealing with the central nervous system is easily the most outstanding section; it occupies rather more than one-quarter of the total bulk of the work. The treatment of the morphology of the nerve-fibres and their terminations is very full; the neuroglia is dismissed rather briefly. In other sections the treatment is somewhat similar to that in other standard text-books. A noticeable feature, however, is the description and illustration of the Golgi apparatus in almost all tissues. A few sections seem too brief and some items of the body are omitted, such as the eye (except the retina, which is fully described) and the meninges.

This text-book which bears conspicuously the mark of its author's individuality and interests is recommended to those with similar enthusiasms as well as to the student. It should do good work in helping to familiarise workers in this country with the achievements of the Spanish school.

An Introduction to Biochemistry

By WILLIAM ROBERT FEARON, M.A., Sc.D., M.B., F.I.C., Fellow of Trinity College, Dublin; Member of the Royal Irish Academy. London: William Heinemann (Medical Books) Ltd. 1934. Pp. 313. 10*s*. 6*d*.

IT is unusual for an experienced reviewer of text-books on biochemistry to feel the slightest interest in any of them. The majority go on the same plan, starting with proteins, fats, and carbohydrates, proceeding through dismal experiments with beef, bread and dripping, dragging on to gastric digestion, and finishing up with a consideration of urine. Dr. Fearon has constructed an entirely original introduction to biochemistry. In the first place it is absolutely up to date, which is uncommon in introductory text-books for students, particularly those designed for medical and biochemical students. The first three chapters contain a description of the elements occurring in biological compounds. These chapters deal with inorganic compounds, and contain an excellent account of carbon dioxide and its physical characteristics when dissolved in water. The chapters on carbohydrates, proteins, and fats are outstanding in their modern outlook. For example, the section on sterols takes account of the most recent work, and indicates the importance of the chrysene ring. The chapter on pigments is also very good and contains a most readable account of the cytochromes.

And so on through the whole book. A little more space might have been given to the internal secretions, but what there is is very well done. Dr. Fearon merits congratulation on what is a very valuable addition to serious biochemical literature.

The Origin of Cancer

By J. P. LOCKHART-MUMMERY, M.A., M.B., F.R.C.S. Eng., Senior Surgeon, St. Mark's Hospital. London: J. and A. Churchill. 1934. Pp. 150. 10*s*. 6*d*.

SINCE the beginning of this century a number of authors (v. D. Hanseman, J. B. Farmer, J. E. S. Moore and C. E. Walker, and Theodor Boveri) have expressed the view that in cancer the intracellular disturbance responsible for the change is located in the chromosome mechanism. They postulated for malignant cells an alteration in the number of chromosomes. Since chromosomes are visible and can be counted, the validity of these theories could be tested. If true they would have had the great advantage of making it possible to distinguish a malignant cell from a normal one by cytological examination. It was found, however, that although malignant cells frequently show changes in the number of chromosomes, these changes are neither consistent nor constant, so that these theories had to be abandoned. The recent development of genetics enabled K. H. Bauer in 1928 to modify them by postulating an alteration in the genes of somatic cells as the origin of cancer. In a monograph entitled "Mutationstheorie der Geschwulst-Entstehung" he put forward the conception that cancer cells are mutations of normal somatic cells. Now genes are hypothetical entities. If they exist, they are beyond the limit of microscopic vision, at any rate in mammalian cells, and almost all we know about their functions refers to germ cells. The truth of the gene theory cannot therefore be tested by cytological methods, and if the theory is true it does not enable us to distinguish a malignant cell from a normal cell. Its value depends entirely on the extent to which it explains and correlates the various features of cancer. From that point of view its usefulness is very limited. If we ask, for instance, why a malignant cell has the power to invade the neighbouring tissue, or why it has a different

metabolism, this theory merely tells us that these are qualities conferred upon the malignant cell by an alteration in the genes. In order to account for the fact that each organ can give rise to an indefinitely large number of malignant tumours, each with its own biological and morphological characters, the theory has to postulate for the cells of each organ an indefinitely large number of gene mutations, all of which differ from each other, but have in common the property of conferring upon the cell a malignant character. The theory does not enable us to understand the relationship between benign and malignant tumours, nor does it throw light on such characteristic features of cancer as the age incidence, or the organ incidence with its variations. That the filtrable fowl tumours do not fit in with this conception goes without saying, since they do not readily fit in with any explanation of cancer which presupposes a purely cellular change.

These criticisms do not put the somatic mutation theory out of court; they merely indicate its limitations. On the other hand, the fact that cancer arises most frequently on the basis of a hyperplasia, whether induced by chronic irritation or in some other way, is in keeping with this theory, since cell division under abnormal conditions affords a suitable opportunity for a mutation to occur. In fact, the occurrence of such a hyperplasia is an essential prerequisite for the somatic mutation theory. Mr. Lockhart-Mummery claims that "in March, 1932, I first put forward the theory of gene mutation of somatic cells as an explanation of the genesis of tumours" (p. 89), and has developed such an affection for the child he has adopted that he can see no fault in it at all. In order to show that the theory in itself explains and correlates practically all the features of cancer, which in the very nature of things it cannot possibly do, he misquotes statements, mis-states facts, and argues in a circle, until in the end he flies off into speculation. He dismisses the "chronic irritation theory"—which is not a theory at all, but a description—as "untenable." He denies the importance of external factors in the environment, and argues from the occurrence of cancer in identical twins, that "external influences, factors in the environment do not play a very important part in the production of mutation, and instability of the gene is the more important factor." On that argument we must assume that women who have borne children have acquired or inherited a greater instability of the genes in the cells of the uterine cervix, with the opposite effect in the cells of the mamma. He writes (p. 98) "as only cells which are actively dividing are able to mutate it follows that the more frequently cells undergo division, the greater the chance, other factors being equal, for a mutation to take place. This must be so." But if this were so we should expect to find mutations to occur most frequently in the embryo, where the cells divide more rapidly even than in most tumours, with the result that cancer should be seen most frequently in early childhood and not, as it is actually seen, in old age. In the adult the tissues where cell division is most rapid are the testis, the ovary, and the lymphoid tissue. But these are by no means the most frequent sites of cancer. On a previous page occurs the remarkable statement that "Strangeways in experiments with tissue cultures of chick embryo found that the cells were very resistant to mutation during the actual division stage, and were most susceptible to mutation during the preparatory stage of division." This statement would be a fair summary if the word mutation is replaced by irradiation, but this is not a misprint, since the statement appears in the discussion on the stage at which mutation takes place most readily. Since radium and X rays are supposed to produce somatic mutations which transform normal cells into malignant cells, and since these two agents are also used therapeutically against cancer, it is argued that they can mutate malignant cells backwards into normal cells, and that this constitutes the rationale of radiotherapy. The difficulty presented by the filtrability of fowl tumours disappears by the words "somatic mutation." The author simply asserts that "everything points to a genetic change in the cell nuclei of the inoculated fowl having taken place." He states (quite wrongly) that these tumours can be transplanted only with difficulty, and identifies the agent present in the tumour filtrate with a mutant gene which is phagocytosed by the normal mesenchyme cells of the inoculated fowl and "during mitosis becomes incorporated in the nucleus and so confers upon that cell its mutant character."

As one turns the pages of this book many familiar and well-established facts acquire a strange appearance. Sometimes they are reversed, sometimes they lose all resemblance to the actual observations, as when the term mutation is substituted for irradiation. One seems to pass with Alice through the looking-glass. And there is Humpty Dumpty replying to our questioning of his knock-down arguments: "When *I* use a word it means just what I choose it to mean—neither more nor less."

Allen's Commercial Organic Analysis

Fifth edition. Vol. X. By various contributors. Edited by C. AINSWORTH MITCHELL, M.A., D.Sc., F.I.C. London: J. and A. Churchill. 1933. Pp. 817. 32*s*.

THIS volume, which completes the fifth edition of this well-known treatise, is of special medical interest. Its first chapter deals in a comprehensive way with blood and its constituents, particularly with hæmoglobin, its compounds with oxygen, carbon monoxide, hydrocyanic acid, and other gases of occasional importance in industrial toxicology, together with the derivatives formed in the human subject in pathological conditions and following the administration of certain drugs. Much space is devoted to the spectroscopic identification of these substances, but the methods for the sensitisation of photographic plates described on pages 22 and 23 are no longer necessary since suitable panchromatic plates are now on the market. The section on the medico-legal examination of blood, occupying 20 pages, is a masterly presentation of the methods adopted for the examination of blood-stains and others simulating them upon a variety of fabrics. This includes the technique involved in microscopical examination, chemical tests, detection of hæmin and hæmochromogen by the formation of crystals, spectroscopic examination, the biological precipitin reaction for identification of the source of the blood and in the determination of human blood groups. The two following chapters are devoted to the albuminoids or scleroproteins and the structural proteins respectively. The former provides inter alia details of the sources, preparation, properties, uses, and analysis of gelatin and its substitutes, fish glue and isinglass, whilst the latter contains much information on silks, natural and artificial, wool and hair, their characteristics and estimation in fabrics. The importance of hair and wool in medico-legal investigations is indicated, and much sound information is given on their microscopical

identification, the composition of hair dyes, and the detection of those irritant dyestuffs in fur which not uncommonly cause cutaneous eruptions.

A section of considerable importance is that on the examination of foodstuffs for vitamins. The chemical, spectroscopic, and biological methods of assay described by various investigators are given together with details essential for the selection, housing, and care of the animals used. This section is completed by an appendix containing the recommendations of the conference on vitamin standards held in London in 1931. The active principles contained in hormones form the subject of the next section, in which details are provided of their sources, isolation, toxicology, and uses for increasing natural secretions when these are deficient, and for modifying the abnormal functions of the body. The final chapters deal with a comparatively new subject, the identification of unknown woods and charcoals, and with the pectic substances derived from fruits and vegetables, these substances being of considerable importance in the ripening and preservation of fruits and in the manufacture of jams and jellies.

The text is singularly free from errors, the few detected being of minor importance, and although the information given has had to be condensed no sacrifice of lucidity or accuracy has resulted. The text of each section being written by a specialist is authoritative and up to date, and thorough reliance may be placed on the experimental methods described as well as on the more theoretical portions of the text. In addition to the subject index of the volume, an index embracing the ten volumes of this edition is included. The whole is a work of reference of value to a wide circle of readers.

The Lighter Side of the War

By A. Cecil Alport, Major, R.A.M.C., T.F., late Captain, South African Medical Corps. London: Hutchinson and Co. 1934. Pp. 290. 18s.

Dr. Cecil Alport, assistant to the director of the medical unit at St. Mary's Hospital, has written an interesting account of his experiences as a doctor during the war, first, on the South and South West African campaigns, and secondly, at Salonika.

The South African half of the book will prove the more interesting to most readers because it describes things which received at the time, and have received since, but little notice. The description of the revolt in South Africa on the outbreak of hostilities in England provides a good picture of opposing views of patriotism, and while the personalities of De Wet on the one side and Botha on the other are well brought out, so are the tactics employed and the bravery displayed on either side. A good case is made out for the statement that the whole international situation might well have been complicated by the loss to British possession of the Transvaal and the Free State had not the rising been met with promptitude. De Wet's rebellion being dealt with, the author proceeds to the story of the South West African campaign. Here we have vivid descriptions of long route marches, and a sharp indictment of the German methods of colonisation. The fortitude displayed in these vast treks was remarkable, and so was the spirit of camaraderie engendered among these voluntary soldiers.

In the latter part of the book, where the activities at Monastir and the Salonika base are recounted, the author goes over ground that has sometimes been rendered familiar by previous writers, but there is ample room for a description like this of events on the spot. Here will be found a good many criticisms of well-known personalities, and not all of them are entirely correct, while a liveliness has been obtained by the inclusion of certain anecdotes that are not all of them entirely new. But to such repetitions objection should not be taken if the jests fall in their right place—as they do; they help to make us realise the situations which are being drawn, and display the author as the sort whose company all would desire in tight places or terrible circumstances. A thoroughly interesting and amusing volume on which the author is to be congratulated.

Fluorescence Analysis in Ultra-violet Light

By J. A. Radley, B.Sc., A.I.C., and Julius Grant, Ph.D., M.Sc., F.I.C. Vol. VII. of a series of Monographs on *Applied Chemistry*, edited by E. Howard Tripp, Ph.D. London: Chapman and Hall, Ltd. 1933. Pp. 219. 15s.

This treatise on the theory, technique, and application of fluorescence analysis is the first to appear in the English language. The authors, who are well-known experts in this complex field, have succeeded in presenting their rich material in a simple and concise way so that even readers who are lacking in a basic knowledge of physics should be able to profit by it.

To the medical profession the chapters on the application of fluorescence analysis to bacteriology, drugs, foods and food products, legal work, and of course to medical and biological science will prove of especial value. The quick detection of hair infection by microspores (ringworm disease), which exhibit a bright green fluorescence; the diagnosis of certain skin phenomena (e.g., vitiligo); the detection of traces of porphyrins in urine and of a great number of drugs, especially alkaloids (hydrastinine, quinine, ergotamine, cotarnine), also of aspirin in the blood, urine, milk, and saliva are only a few examples of the diagnostic value of fluorescence analysis in medicine. The description of the various sources of ultra-violet light and of suitable light filters contained in the first part of the book should help those concerned with the installation of adequate equipment.

A Survey of the Science of Psychology

By J. R. Kantor, Professor of Psychology, Indiana University. Indiana: The Principia Press. 1933. Pp. 564. 16s.

Prof. Kantor's platform is that of an interactional psychologist believing that psychological thought can be best expressed in terms of the laws governing the relationship of an organism to its environment regarded as stimulus. In this sense he denies both dualism on the one hand and behaviourism on the other. Basic behaviourism is psychological and thus subsequent sophistications in response have rich foundations in the earliest years which are in this measure the roots of individuality. After laying down these fundamental guiding principles the book proceeds to analyse mental functions on traditional lines, howbeit with constant reference to the most recent advances. The latter third of the book is mainly biological and anthropological, and the treatment is both original and stimulating. The book would have been much more readable had the author refrained from using barbarous words. The bibliography is good but for the prejudiced omission of works on psychopathology.

THE LANCET

LONDON: SATURDAY, MARCH 31, 1934

THE IMPROVEMENT OF MORTALITY-RATES

ELSEWHERE in this issue we print a paper by Dr. KERMACK, Colonel McKENDRICK, and Dr. McKINLAY which will interest a circle of readers beyond the students of mathematical and statistical problems to whom the three authors are already well known. It shows that if the rates of mortality of England and Wales in decennial age-groups are expressed as a percentage of the rates obtaining at a particular previous epoch and arranged on a chess-board in which rows correspond to secular time and columns to life time (see p. 699, Table II.) the result is that the entries in the diagonals are approximately equal. For instance, when expressed as a percentage of the rate prevailing in 1841–50, the rate of mortality in the age-group 5–15 in 1861–70 was 87, the rate of mortality in the age-group 15–25 in 1871–80 was 75, the rate of mortality in the age-group 25–35 in 1881–90 was 74, the rate of mortality in the age-group 35–45 in 1891–1900 was 81, and, proceeding thus, we have 84, 84, and 82, the last figure being the rate of mortality in the age-group 65–75 prevailing in the decennium 1921–30, expressed as a percentage of the corresponding rate in 1841–50. A similar rule is found to hold for Scottish experience. The longer secular record of mortality in Sweden appeared to be recalcitrant, but if a section of the table (from 1855 onwards) is omitted a similar trend can be discerned.

The authors are far too well versed in the intricacies of statistical problems to be dogmatic in their interpretation of these results, but their paper should stimulate research in many directions. Probably some of our unmathematical readers who, declining to be terrified by a repulsive symbolism and such vaguely terrifying phrases as "complete expectation of life," "curtate expectation of life," and so on, have discovered what those portentous documents the National Life Tables really mean, have recalled a line in Horace concerning the obstetrics of mountains. For the last English Life Table does not tell us how the generation in being in 1921–23 will die out, but how it *would* die out if the rates of mortality prevailing in every age-group in those three years were never to change. And even in these pessimistic days, professional esprit de corps will hardly allow us to believe that no improvement in rates of mortality in any age-groups is possible. The answer of an actuary to any such criticism is that he is an arithmetician not a prophet, and the answer is unexceptionable; but the retort is also unexceptionable—namely, that his table does not tell us what most people are interested to know—what is likely to happen to *them*. Out of official hours, some actuaries (especially, we think, some Italian writers) have toyed with the idea of current life tables—i.e., of constructing tables in which the rates of mortality at advancing ages are based on advancing secular experience. KERMACK, McKENDRICK, and McKINLAY point out a hopeful way of trying to do what we all wish to have done. In view of their results, it does not seem quite so chimerical as it once did to suppose that we might construct a life table which would tell us what the "expectation of life" of men *now* aged, say, 40 really is. Naturally, as they point out, much more detailed analysis will be required before anything could come of the proposal, but they have suggested a method, and in language all intelligent readers can understand.

How far their explanation—namely, that environmental factors up to the age of 15 are of overriding importance—is acceptable cannot be determined. Of course some will point to the historical fact that in industrial life the legislature intervened to safeguard the children before any protection was given to adults. It is, however, very difficult to propound a plausible working hypothesis of delayed environmental reforms, passing from age-group to age-group, which will adequately account for the results. It is hardly necessary to add that the authors do not suggest that environmental factors cannot influence rates of mortality at later ages; their data are derived from countries and epochs in which (if we exclude war periods) on the whole the conditions of life at all ages have improved.

We hope that the discussion initiated by this valuable paper will lead to further investigation of the whole subject.

THE CONTROL OF THE BLADDER

WE have already referred [1] to an investigation by Dr. D. DENNY-BROWN and Dr. E. GRAEME ROBERTSON into the control of micturition by the normal subject. Their important work has now been extended [2] to patients with two types of lesion—destruction of the sacral roots of the spinal cord, and complete transection of the cord in or above the lumbar region, the cord being intact below the section. The effect of the first lesion is to destroy the central connexions of the pelvic nerves (nervi erigentes) which terminate peripherally in the vesical plexus, and of the pudic nerves which supply the external sphincter and other perineal muscles. The second lesion leaves these central connexions intact, but cuts off all communication with higher centres. The influence of the hypogastric nerves, originating in the lower thoracic and first lumbar segments and passing via the inferior mesenteric ganglion to the vesical plexus, is so slight that it may be neglected in this summary.

[1] THE LANCET, 1933, ii., 605.
[2] Brain, 1933, lvi., 397.

Either of the injuries gives rise first of all to a condition of shock. The bladder is passively distended, with the detrusor musculature completely paralysed and the internal sphincter tightly contracted; the external sphincter, in common with other voluntary muscle, is flaccid. This state merges into one where the detrusor muscle displays a slight reaction to stretching and, in accordance with the strict reciprocal activity of the internal sphincter, the latter becomes slightly less constricted so that intermittent dribbling takes place, the bladder remaining distended. Ultimately the contractions of the bladder become more marked and fuse into large waves. Coincidentally the relaxation of the internal sphincter becomes more complete, and a low-grade automaticity is established; the bladder may become small, and its emptying is brought about by any accidental passive increase of pressure on its contents. In lesions of the cauda equina, recovery is arrested at this point, but coördinated activity is undoubtedly present and this coördination must of necessity be vested in some local mechanism, probably the vesical plexus. If the lower segments of the cord are intact, however, the recovery proceeds further. The bladder wall reacts more promptly to sudden slight increments of pressure—brought about by coughing, for example—and is altogether more sensitive. The internal sphincter, on the other hand, is more tightly closed, so that although it relaxes reciprocally with contraction of the detrusor, it resists slow steady pressure much more efficiently than before. During sleep, therefore, when incidental disturbances are at a minimum, the bladder fills more completely and its automaticity is of a higher grade. The local nervous mechanism may be regarded as being reinforced by its spinal connexions, but over and above this reinforcement are important reflex effects which lend further control. Contraction on the part of the detrusor may initiate impulses which, passing to the cord, give rise to evacuation of the rectum—i.e., there is a coördinated "discharge of the whole detrusor mechanism." Further, cutaneous stimuli from regions supplied by the sacral segments facilitate a discharge of the neurones supplying the bladder wall; tickling the thigh is a time-honoured method of initiating micturition when this is independent of the higher centres. Other reflexes inhibit automatic micturition, and this inhibition is enhanced by contraction of the external sphincter. Contraction of the detrusor alone causes relaxation of this muscle; all other reflexes make it constrict. Such is the picture, in outline, of automatic micturition under local control with and without the added influence of the lower spinal segments; many further details and important consderations are to be found in the original paper.

"We have not had the opportunity," write the investigators, "of following the reaction to distension from the initial depression of spinal shock, but it is clear from the work of Holmes that, seen in full perspective, the reaction to distension makes a progressive development in parallel with all other spinal reflexes. Both phasic and tonic reactions of the bladder emerge in a gradual manner from the atony of spinal shock." This work of GORDON HOLMES, performed during the war, is now published for the first time,[3] and in striking fashion helps to complete the observations and support the conclusions of DENNY-BROWN and ROBERTSON. A further quotation from the latter introduces a controversial question: "The reactions of the bladder mediated by the vesical plexus and sacral segments of the spinal cord," they say, "differ from those of the normal bladder only in lack of appropriate restraint." In other words, the inhibitory action of the higher centres, previously described, is alone necessary to convert an automatic into a normal bladder. But O. R. LANGWORTHY and L. C. KOLB,[4] of the Johns Hopkins University, advance animal experiments which lead to a divergent view. They maintain that, like the general musculature of the body, the bladder receives tonic nervous impulses from the mid-brain. Cut off from its cerebral connexions, the reflex path concerned overacts, causing great irritability of the bladder; a human parallel is seen in patients who suffer from "imperative micturition." Destruction of the path by spinal transection below the mid-brain leaves a toneless bladder showing retention with overflow. They point out that even when automatic micturition is established, emptying is incomplete and a variable amount of residual urine is left in the bladder. DENNY-BROWN and ROBERTSON do not agree that this indicates incoördination of micturition, and attribute it rather to a state of reflex coördination in which the valuable inhibitory reflexes play a full part. The work of the American authors, however, supports the conclusions of F. J. F. BARRINGTON, to whose work references will be found in both papers, and it is doubtful if tonic bladder reflexes whose paths pass through the brain-stem can so easily be eliminated.

THE CAUSES OF MENTAL ILLNESS

IN his effort to elucidate the problems of disease the general clinician continually seeks to think in terms of the pathology he knows. A survey of the reports from mental hospitals reveals that the alienist tends to work from a different outlook. He is still largely harassed by descriptive symptomatology. He knows that certain psychoses tend to recur, that many cases of chronic dementia præcox have been reclusive individuals in adolescence, and that certain physical conditions are more liable to lead to mental breakdown than others. An increasing volume of evidence appears to point to alterations in the physiological response of the psychotic, but whilst some regard these changes as primarily metabolic others believe them to be emotional in origin. The psychiatrist knows that his patients tend to come from what is conveniently called bad stock, but he is by no means clear why it is the patient who has broken down at 25, and not his sister of 40 or his brother

[3] Brain, p. 383.
[4] Ibid., p. 371.

of 35 who share the same stock. In whatever direction his own inquiring spirit leads him he is encouraged by his masters to seek the cause of every mental disorder from two different motives. The patient's family is longing to be assured of some cause to allay their own concern; the Board of Control is assiduous in the supply of forms which the asylum officer is required to complete. The physician thus harassed can in some cases supply many causes, in others none.

Some of these difficulties emerge in the annual reports of mental hospitals which we have recently received. Dr. C. C. EASTERBROOK, of the Crichton Royal, Dumfries, divides the causes, other than those of the "usual underlying and predisposing factor of a nervous constitution," into five stresses —viz., pathological, biological, psychic, toxic, and hygienic. Many of these stresses and their effects overlap as the figures given illustrate. Thus the physical health of 54 per cent. of the admissions into the hospital was poor. It is possible to speak of such conditions as stresses, but in many the physical emaciation is the result of the psychosis and not its cause. In 46 per cent. psychic stresses such as "worry, grief, affliction, anxiety, and shock" are cited. It is a matter of no small difficulty to differentiate between conditions in which real anxiety has precipitated the illness and those in which an abnormal sensitiveness to anxiety has exaggerated some trivial event. Both alcoholic excess, and insufficient rest and sleep, may be early signs of a manic-depressive episode and cannot be always held to be exciting factors though they are certainly intensifying causes of the severer signs. Solitary life and want of occupation may be regarded as the cause of mental instability when they are sometimes two of its manifestations. While Dr. EASTERBROOK finds critical periods of life partly responsible for 58 per cent. of his admissions, Dr. F. R. P. TAYLOR, at the East Sussex Hospital, discovers this factor in only 35 per cent. At this hospital a family history of mental disorder was found in 73 per cent. of admissions, though at Inverness such a history was only found in 35 per cent. It is probable that the careful taking of the family history by the social service worker in the former hospital has something to do with the difference.

The number of possible contributory causes being so large must raise a doubt whether this admirable search for the causes of mental disorder may not defeat its own ends. For the geneticist the study of single factors is all important, and it may be that there is a place for those who will concentrate only upon those mental patients in whom one environmental factor, and one factor alone, seems to lie at the root of their illness. Such a quest would require more, not less, careful search into the family and personal history of each patient, and it might well confirm the belief that there is never one single cause of mental disorder. But in the meantime it would necessitate the diligent assessment of onus and this would make both for scientific accuracy and for great understanding of the problem of psychotic ætiology.

A PROGNOSIS SERIES

ON another page Dr. ROBERT HUTCHISON provides, from his ripe experience, an introductory article to a new series which purports to offer guidance in the difficult art of prognosis. It is significant that these words can be used without fear of arousing tedious argument whether this division of medicine is indeed more of an art than a science. No one would claim scientific status for the basis on which medical forecasts are hazarded, whether of immediate fatality or survival, of probable duration of life, or of degree of recovery of normal vigour. That some doctors and nurses have developed an almost uncanny gift of prophesy is undisputed; but their power is founded on a combination of diagnostic and therapeutic skill with good judgment and, above all, with wide experience. It is this experience that we are inviting those who have watched the progress of large numbers of cases of certain diseases to share with their colleagues in more general practice. Certain crucial factors will have been sorted out as associated with if not actually determining either recovery or disaster, and critical examination of these over a term of years should have eliminated those whose relation to prognosis, though suspected, could not in fact be established. Admittedly few trustworthy statistics on prognosis are available. They are hard both to collect and to interpret; on the other hand, vague impressions based on optimism rather than on experience can only be misleading. It is significant, however, that many of the conclusions reached from the statistical study of the after history of 1000 cardiac cases, on which we commented recently,[1] were precisely those which were already accepted as clinical phenomena. But even should some opinions and impressions recorded in this series be subsequently disproved, their definition should be of value in stimulating follow-up studies of large numbers of cases over many years, a branch of clinical research only now coming into its own.

It is fitting that Dr. HUTCHISON should open the series, for he has called attention, in a lecture originally published in our columns and later as one of a trilogy on Some Principles of Diagnosis, Prognosis, and Treatment,[2] to the meagre literature on this most difficult subject and to the educational value of attempts at accurate forecasts of the course of every case of serious disease, even if these are falsified by the result. He has reminded us aptly that in medicine there abideth faith, hope, and charity: "we have Diagnosis, which is a matter of faith; Prognosis, which is a question of hope; and Treatment, which is too often an affair of charity." And though the greatest of these is diagnosis, for without it one cannot either forecast the course and outcome of a disease, or treat it satisfactorily, yet an error in prognosis does more harm to a doctor's reputation than an error in diagnosis. This is unjust, for, as Dr. HUTCHISON points out, a wrong diagnosis may cost a patient his life, which a false prognosis

[1] THE LANCET, March 10th, p. 524.
[2] Bristol: John Wright and Sons. 1928.

can never do. Errors in prognosis, when not inevitable through lack of pathological knowledge, may be due to the attachment of too much importance to physical signs and too little to the patient's general condition; to failure to allow for possible complications; or to refusal to face the facts. The doctor's own temperament, and his age, may influence his prognosis; the young doctor has not yet learnt by experience how well a patient can get on even though his organs be seriously impaired. Subjects to be dealt with in our next few issues include the prognosis in enlargement of the prostate, in tuberculous laryngitis, in diabetes and in acute rheumatism in children. Next week Prof. D. P. D. WILKIE will deal with the prognosis in gall-bladder disease. The success of previous series of short signed articles on treatment and on aids to diagnosis, contributed by invitation to this journal, justifies the hope that this series will meet with equal appreciation.

ANNOTATIONS

LATENT BRUCELLA INFECTIONS

THE question is often asked why it is that, with 20 to 30 per cent. of the raw market milk infected with *Brucella abortus*, undulant fever is not more common. It is less frequently asked why, with 6 to 7 per cent. of the same type of milk infected with the tubercle bacillus, tuberculosis of bovine origin is not more common. Yet the two questions hang together closely. Underlying them both is the tacit assumption that the presence of the infecting organism is alone sufficient to give rise to overt disease. This assumption arose in the very early days of bacteriology, when the rapid discovery of one pathogenic organism after another seemed to be affording a complete answer to the mystery of infection. The first warning note was struck when, as the result of experiments on human volunteers, it was found that the mere ingestion of the cholera vibrio was not always sufficient to give rise to cholera. Koch, who was thinking very much more deeply than many of his colleagues, realised the significance of this fact—namely, that in the pathogenesis of disease the specific micro-organism is but one of the factors involved. The next important stage in the realisation of this truth was the discovery of healthy carriers. Of recent years attention has been concentrated on the occurrence of latent infections and on mild atypical infections. It is now clear that the resistance of the host, determined probably by a multitude of genetic, physiological, and environmental factors, plays a very large part in determining whether a given pathogenic organism gaining access to the body shall be rapidly destroyed, shall give rise to a latent inactive or a latent active infection, or to a mild atypical or a fully developed typical case of disease. With some organisms, such as the typhus virus, the proportion of typical cases to latent infections appears to be high; with other organisms, such as the meningococcus, the typical cases form only a small fraction of the total number of infections. The fallacy of attributing all power to the infective agent alone is being gradually realised, and a wide field of research now lies open to those who wish to study the factors determining the resistance of the host.

Work, both in Europe and in America, goes to show that *Br. abortus* is an organism endowed with a fairly high infectivity but a relatively low pathogenicity for man. A considerable proportion of those who come into contact with it become latently infected, as revealed by the appearance of antibodies in the serum, but only a small proportion manifest actual symptoms of disease. Sometimes typical undulant pyrexia is the predominating feature; probably more often irregular fever, with sometimes bronchial, intestinal, or bone and joint symptoms, is met with. In regard to the incidence of overt disease due to *Br. abortus* there is a remarkable similarity between different countries having similarly infected bovine populations. Russ [1] has just reported figures for two of the Austrian states—Lower Austria and Burgenland. During the years 1929 to July, 1933, sera were examined from 7406 patients with undiagnosed pyrexia, most of whom were suspected of suffering from enteric fever. Of 6428 sera tested against organisms of the typhoid-paratyphoid group, 1907 (29·7 per cent.) reacted to an apparently significant titre, while 164 (2·2 per cent.) of all sera agglutinated *Br. abortus* to 1/100 or over. These proportions may be compared with the figures for Widal sera in this country—namely, 21 per cent. agglutinating organisms of the typhoid-paratyphoid group and 3·5 per cent. agglutinating *Br. abortus*. In other states of Austria the proportion of sera agglutinating *Br. abortus* appears to be even higher. The occurrence of latent infections in persons brought into contact with *Br. abortus* has been demonstrated by numerous workers, and is again referred to by three workers in Armenia who found [2] that 8·7 per cent. of sera from 399 veterinary and agricultural students in contact with infected cattle agglutinated *Br. abortus* to 1/100 or over, whereas of 268 sera from medical and other students who were not specially exposed to contact infection only 1·9 per cent. reacted positively. Studying the history of 42 reactors, they found that 11 were ill at the time, 15 had a history of undulant fever, while 16 were well and had no history of this disease. It is noteworthy that only one of the 15 cases of undulant fever had been correctly diagnosed. The authors consider the term "undulant fever" unfortunate, because the characteristic pyrexia is frequently absent, and suspicion of the true nature of the disease often never arises.

Latent brucella infections are by no means confined to man. Recent work by a number of authors has revealed their frequency in animals. It has been shown, for instance, that cows may excrete *abortus* bacilli in their milk without ever having aborted or shown any manifest symptoms of disease. Van der Hoeden [3] has infected horses, dogs, and goats with *Br. abortus*, and has recovered the infecting organism after some time from the blood or the internal organs; yet none of these animals showed any clinical evidence of illness.

THE DENTAL BOARD

WHILE six members of the Dental Board of the United Kingdom are chosen directly by dental practitioners, the non-dental members of Board, including the chairman, outnumber the dental representatives. The qualified dentists in England and Wales elect two members, in Scotland and Ireland one each; dentists registered without qualification under the Dentists Act of 1921 elect the other two. Four of

[1] Russ, V.: Wien. klin. Woch., March 9th, p. 289.
[2] Herrmann, O., Mirsabekjan, A., and Megrabjan, R.: Zeits. f. Immunitätsforsch., 1934, lxxxi., 500.
[3] Van der Hoeden, J.: J. Comp. Path. and Ther., 1933, xlvi., 232.

these six direct representatives have held office for ten years, the other two for five years, and all of them retire on July 28th next. Notices of election are to be sent out on May 8th. The last day for nominations to be received at the offices of the Dental Board is May 30th. Voting papers will be issued on June 13th, to be returned not later than the 23rd, and the votes will be counted from the 25th to 27th. The direct representatives now are Mr. W. R. Ackland, M.D.S., M.R.C.S., Mr. W. H. Dolamore, L.D.S., M.R.C.S. (who is a treasurer of the Board), Mr. J. W. A. McGowan, L.D.S., Mr. E. L. Sheridan, L.D.S., F.R.C.S.I., Mr. W. F. Bowen, and Mr. Fred Butterfield. The importance of the election would be enhanced if it were generally recognised how great is the power placed in the hands of the Dental Board in the matter of dental education owing to its possession of an income so vastly greater than that of the General Medical Council. Doctors pay a substantial fee for registration of their qualifications, but have nothing more to pay for retention of their names on the Medical Register. Dentists pay a smaller fee for registration but have to supplement it with an annual levy for the privilege of remaining on the Dentists Register. Last year the fees for original registration in the Dentists Register amounted to £598, fees for retention amounted to a sum no less than £30,152. The expenditure of the Board under what might roughly be called administration amounted to some £12,000, leaving more than £30,000 available for educational purposes which enabled the Board last year to allot a sum of £310 to lectures in dental schools, £4000 to dental health education, £5600 to grants for research, and a sum of £21,000 to educational grants. The whole yearly income of the General Medical Council does not amount to £9000.

HYPOCHROMIC ANÆMIA IN MEN

HYPOCHROMIC anæmia which cannot be attributed to any recognised cause, such as hæmorrhage, infection, toxæmia, or new growth, is fairly common in women but rare in men. Indeed, M. M. Wintrobe and R. T. Beebe [1] state that in 96 per cent. of the recorded cases the patients were women. A somewhat different incidence is indicated by Dr. S. N. Burger and Dr. L. J. Witts, writing in the current number of *Guy's Hospital Reports*; for of their 163 patients as many as 26 were males, the condition being strictly comparable, they believe, in the two sexes. It must be noted, however, that in a large proportion of men they discovered complicating factors. In three cases, for example, the condition followed operative interference with the stomach. Two had palpable hard livers, and one of these had had epistaxis, while the other had had hæmatemesis. Three had an impaired lævulose-tolerance test or a history of jaundice, one had persistent occult blood in the stools for which no cause was found, and three had hæmorrhoids with slight bleeding. The typical syndrome of a hypochromic anæmia, seen so often in women, with true microcytosis, achlorhydria, splenomegaly, and dystrophic changes in the tongue, pharynx, and nails, was rarely encountered, except as a sequel to operative interference with the stomach. Eight of the male patients were under 30 years of age, and 18 were over 40. In only one was there a bad dietary history. Achlorhydria or extreme hypochlorhydria was present in 11 of the 26, and three of these had previously had gastric operations; 10 of the older patients had symptoms of gastritis or gastro-enteritis, in some cases due to oral sepsis. Some showed a tendency to spontaneous improvement. All did well on iron, and there was no relapse when once the anæmia had been cured if treatment was stopped, which is contrary to what usually occurs in women. Since the anæmia is remedied by iron, Burger and Witts suggest that it is due to iron deficiency, probably dependent on diminished absorption from the gastro-intestinal tract.

[1] Medicine, 1933, xii., 187.

TESTIMONIAL TO PROF. R. W. REID

THE colleagues, former pupils, and friends of Emeritus Regius Prof. R. W. Reid, desiring to mark their appreciation of his long and distinguished services to the University of Aberdeen, have appointed a committee consisting of representatives of the university court, the senatus, former students, and others, to arrange for a testimonial. Twenty-eight years ago Prof. Reid instituted the anthropological museum at Aberdeen, and has since acted as its honorary curator. By his zeal he has not only created and catalogued a valuable museum—a great teaching asset to the university—but has stimulated and done much to promote the interests of anthropology, particularly in relation to the prehistoric peoples of the north of Scotland. It is proposed that the testimonial should take the form of a fund, the revenue of which should be utilised for the foundation of a lectureship in anthropology, including the cultural and sociological aspects of the subject. Prof. Reid is a doctor of medicine and an hon. doctor of laws of the University of Aberdeen, and a Fellow of the Royal College of Surgeons of England. He sat for five years on the General Medical Council. The appeal for the testimonial is signed by the three principal officers of the university, Lord Meston, Mr. Walter Elliot, and Sir George Adam Smith. Contributions to the hon. treasurer of the fund, Mr. H. J. Butchart, secretary to the university, Aberdeen.

SWIMMING BATHS

THE swimming season will soon be upon us and the public or private owners of swimming baths who have not installed filtration and chlorination plant will be in trouble after the first few days or weeks—the period of immunity will depend on the temperature, for bathing goes up and down with the thermometer—especially if the water-supply remains at all restricted. In these circumstances any knowledge which will enable a fill-and-draw bath to be kept in tolerable condition may be valuable. Messrs. A. H. Fletcher and E. C. Link, of Memphis, Tennessee, describe [1] work on 13 swimming pools in that city. Of these, four were outdoor and two were indoor fill-and-draw pools, three were poorly designed and three were well-designed circulating pools. Ultra-violet ray machines had, it seems, been abandoned and the disinfecting agent was added by hand, but no clue is given to the conditions under which ultra-violet sterilisation failed. It may be suspected that defective filtration led to turbidity and insufficient penetration of the rays into the layers of water submitted to their action. One new pool was designed for use with chlorine alone. It was found that where effective mixing of chlorine with water was difficult the use of chloramine had certain advantages. Its milder action allowed a greater excess of chlorine to be used without affecting the eyes or mucous membranes and gave time for diffusion throughout the water before all free chlorine was exhausted. Doses of copper sulphate up to five parts per million every other night were needed in outdoor baths to keep down green growths—this is a much higher figure than when chlorination

[1] American Journal of Public Health, December, 1933, p. 1255.

and filtration are effective. By using ammonia and chlorine outdoor baths could be kept in use if filled only once in two weeks; indoor baths could be kept going for four weeks. The preliminary dosing with ammonium salts needed strict control as excess of ammonia slows down the action of chlorine on bacteria. The pH too requires watching and it does not seem reasonable to expect that the process can be worked by the bath attendant using such simple tests as he can apply; the attendant on a fill-and-draw bath is little likely to have the time or ability to do more than add reagents in a routine manner. One point of technique is of interest. The samples taken for examination were at once dechlorinated by sodium thiosulphate to avoid the continued action of the residual chlorine before plating. Attention was recently called in our columns to the false sense of security produced by neglect of this precaution.[2] The use of chloramine offers a means of keeping fill-and-draw baths in fair condition for some time if careful supervision is possible. But fill-and-draw baths must be regarded as obsolete.

EFFECTIVENESS OF BIRTH CONTROL

THE quarterly journal of the Milbank Memorial Fund for January contains an attempt to estimate the efficacy of contraceptive methods as ordinarily practised in America. Two officers of the Fund, Dr. Regine K. Stix and Mr. Frank W. Notestein, have made the inquiry, which is based upon records of 714 women who attended the birth control clinical research bureau of New York City in the year 1931. These women were visited by Dr. Stix in their homes. The average length of marriage in the series was ten years, the average number of pregnancies was 3·23 per woman, and of live births 2·26, and an important finding of the investigation was that the preventive methods, various in kind, did not in any way lower the capacity for motherhood when this was desired. Two-thirds of the women were Jewish, one-sixth Catholic, and one-tenth Protestant. Their incomes ranged from $400 to $20,000, with a median income of $2300. In 1932 the median income had dropped to $1200, about a fifth of the families being destitute or supported by organised relief. Forty per cent. of the families in the group used contraceptives immediately after marriage and an additional 40 per cent. started to use them some time before the beginning of the second pregnancy. The following contraceptive methods had been used in the frequencies specified: coitus interruptus 33 per cent., condom 32 per cent., douche 23 per cent., vaginal suppository 6 per cent.; other methods, including rubber caps, jellies, syringes, and intra-uterine devices, 5 per cent. No attempt was made to differentiate the effectiveness of the different methods. The mass results are pooled and their effects estimated according to a method, devised by Prof. Raymond Pearl, in which the years during which a woman is exposed to pregnancy are added together and tabulated in one column, and in the adjacent column is given the number of pregnancies experienced within this period. From the two totals is computed a rate which is designated as that of the "pregnancies per person-year of exposure to risk of pregnancy." This rate, multiplied by 100, gives the working rate, which is the number of pregnancies per 100 person-years of exposure to the risk of pregnancy. The details of how this method of computation is applied to the present material are highly technical. The general conclusion, however, is that over a given period of exposure to the risk of conception the contraceptive practices adopted by the 714 women in the series were about 75 per cent. effective in preventing pregnancy. But it is possible to argue that the success of the practice for this selected group of manifestly fertile women, who attended a birth control clinic, may be greater than would be expected in a similar group of women who did not attend a clinic.

[2] THE LANCET, 1933, i., 1296.

MEDICAL HARROVIANS

MEDICAL men educated at Harrow will find much to interest them in a register of the school in the sixteenth, seventeenth, and eighteenth centuries which has recently been published.[1] The records of men whose fame is spectacular are naturally more full than those commemorating Harrovians who followed a medical career; but references to medicine are not confined to accounts of its votaries. For example, it is recorded to his credit that the Hon. William Henry Bouverie, one of four members of the Radnor family who were at Harrow in or near 1765, was "distinguished by the polished elegance of his manners, the urbanity of his disposition, and his literary acquirements. He took great interest in medical science and was on terms of great intimacy with several medical practitioners." In Part I., which covers the period 1571–1770, we find Charles Combe, apothecary and later physician, who was educated at Harrow; John Sheldon, who "while at Harrow school was flogged for making a boat and floating it," afterwards became professor of anatomy to the Royal Academy, and then surgeon to Westminster Hospital; and Frederick Thackeray, who practised at Windsor as a physician, was the author of an "eminent" medical thesis. In Part II. (1770–1800) is included one James Scratchley, an army surgeon, who on leaving the troop of Light Dragoons was presented with an address praising "his readiness to aid and succour the afflicted and the kind attention and pleasing manner in which he had invariably treated his patients." Apart from the records of old Harrovians who practised medicine, there are some fascinating pen pictures. The 6th Earl of Barrymore was "a confirmed gambler, and not devoid of cheating"; Benjamin Drury, assistant master at Eton, was forced ultimately to resign his mastership owing to his addiction to boxing. Of Philip Douglas it is said: "The excessive thinness of both himself and his wife occasioned a distich by Mansel, who described them as 'two splinters which make but one bone.'" Arthur Forrest, finding his bigamy was likely to be discovered, conveniently "fell into a fever and died"; and John James Hamilton was such a stickler for form that on the elopement of his second wife he is said to have begged her at least to go in state in the family chariot; he went out shooting in his Blue Riband, and required his housemaids to wear white kid gloves when making his bed.

[1] The Harrow School Register, 1571–1800. Compiled and edited by W. T. J. Gun, F.R.Hist.Soc. Longmans Green and Co. 1934. Pp. 165. 12s. 6d.

COLONEL ARTHUR LYNCH

THE death occurred in a London hospital on March 25th of a member of the medical profession who, outside that profession, had a varied and even sensational career. Arthur Lynch was born in Australia of an Irish father and a Scottish mother. He was trained at Melbourne as a civil engineer. He qualified as such with a diploma in Berlin, but soon turned his attention to journalism, while he became deeply interested in social science and psychology. On both of these subjects he wrote profusely

as a journalist, and published his writings in several volumes while he was still quite a young man. His interest in Irish politics commenced at this time, but he was unable to obtain a seat in Parliament until he was 40 years of age, many things happening in the interval. During the South African war he became a conspicuous character, for he threw up his journalistic appointments and went to fight under General Botha against the English cause. He thus became guilty of high treason, which did not however deter him from standing for an Irish seat in Parliament immediately after the war. The political position being what it was his election was a foregone conclusion for Galway, and in 1901 he returned to this country. He was arrested and sentenced to death, the sentence being immediately commuted to imprisonment for life. At the expiration of a year he was released on licence, and three years later he was granted free pardon. Upon his release he began to work for medical qualifications, and in 1908 obtained the English double diplomas, which was somewhat of an exploit for a man of his age, despite a certain familiarity with general science. For a time he went into practice, and in 1909 he was elected member for West Clare. During the European war he gave unstinted support to the cause of the allies; he entered the British Army with the temporary rank of colonel—the rank which he had previously enjoyed when serving under Botha—and was successful in recruiting work in Ireland. Since the war, while continuing medical practice in London, he wrote several books of a very ambitious nature introducing in one a new system of psychology and formulating in another a scientific case against Einstein's theories.

Lynch was a man of great capacity. He secured qualifications in two different and difficult directions, an interval of over 20 years occurring between his courses as a student. He was a successful journalist, and his writings bore testimony to his versatility and industry. He displayed courage in the field when fighting as a rebel, and moral courage when he came out strongly on behalf of the allies in the war. His versatility prevented him from doing greater justice to himself; he was unable to recognise his limitations when he entered the literary arena, and was undoubtedly chagrined that certain of his works did not receive more important attention.

ARTIFICIAL PYREXIA FOR SYPHILIS

THERE is good evidence that the *Treponema pallidum* is destroyed both in vitro and in the tissues by exposure to a temperature of 107·6° F. for one hour, or to slightly lower temperatures for a longer time. It is now possible to produce this degree of hyperpyrexia in man, and C. A. Neymann and S. L. Osborne, of Chicago, have accordingly inquired into the modification of physiological functions which treatment of this kind produces. Perspiration, fluid intake, urinary output, plasma concentration, and basal metabolic rate are all discussed in their paper,[1] and the conclusion drawn is that "robust patients" may be raised to the required temperature for over two hours without harm. The most valuable part of their investigation bears upon two practical issues—namely, the treatment of patients whose vitality is low, and the importance of ensuring that every part of the body has been treated. With regard to the first, it appears that the rise of temperature induced by the application of external heat is gradual, and often produces symptoms of prostration; these may be related to the fact that the axillary temperature tends to become higher than the rectal temperature. Hyoscine, by inhibiting perspiration, also produces a relative rise in axillary temperature, and may cause not only delirium but also uncontrolled rises of temperature. In general, therefore, penetrating heat (diathermy or radiothermy) is to be preferred, and hyoscine avoided; morphine may be used without ill-effect. The second point is that when penetrating heat is used, all parts of the body do not react equally. This is proved by the heroic expedient of soldering thermocouples into spinal puncture needles and introducing the latter into the subcutaneous tissues, liver, spinal canal, cisterna magna, &c., axillary and rectal temperatures being simultaneously recorded by pyrometers. The temperatures of the axilla, spinal canal, and cisterna magna keep fairly well together at the height of the treatment, the rectal temperature being half a degree higher; but the subcutaneous temperature remains two degrees lower, and diminishes still further as the extremities are approached. Neymann and Osborne consider that these facts explain the successful use of "internal" heat for cerebro-spinal syphilis, and its failure to eliminate the early generalised disease. "Like temperatures produce like therapeutic effects," but the successful treatment of generalised syphilis, they believe, requires that all parts of the body shall be raised *simultaneously* to the required temperature. Although the temperature gradient from within outwards can be reversed by using external heat, this has the disadvantages previously indicated. Neymann and Osborne are now studying the effects of combined external and penetrating heat, and the alternative possibility of raising the internal temperature so high as to be able to neglect the unfavourable gradient. If they succeed in perfecting a physiologically harmless routine treatment, the effect on the therapeutic approach not only to syphilis but to other general infections may be profound. There can be little doubt, however, that they are working very close to the limit of endurance of the tissues, and since it is probable that some types of cell are more easily damaged than others, prolonged after-observation should figure largely in their programme. Incidentally it may be recalled that Levaditi and others who have studied the effect of artificial pyrexia in animals and man think it likely that it does good not so much by killing the spirochætes as by stimulating the organism to resist them.

[1] Amer. Jour. Syph. and Neurol., January, 1934, p. 28.

SIR ALEXANDER HOUSTON'S SUCCESSOR

Major C. H. H. Harold, O.B.E., M.D., D.P.H., was appointed on March 23rd by the Metropolitan Water Board, in succession to the late Sir Alexander Houston, as director of water examination. Major Harold is at present the assistant director of hygiene of the Southern Command, responsible for the supervision of water systems and sewage plans within an area extending from Birmingham to Cornwall, and he is engaged in remodelling water installations in the Salisbury Plain area. He qualified in 1907 at Liverpool, where he was Holt fellow in physiology. After joining the R.A.M.C. he went to India in 1912, and was in charge of the bacteriological laboratory at Basra, until in 1916 he became sanitary staff officer to the Third Lahore Division. The Punjab was then being swept by successive epidemics of cholera, dysentery, and enteric fevers, and it was on his recommendation that deep tube wells were installed as an experiment, and the system he then advocated has since become the standard source of

supply in India. In 1918 he was responsible for initiating permanent water-supplies over a road length of 1300 miles in East Persia. After his return to this country in 1922 he undertook the examination of drinking water and sewage in the Aldershot Command, and made extensive research into the chlorine and ammonia treatment. He has thus had practical experience of the selection and bacteriological control of every type of water-supply and has dealt with all varieties of water-borne disease.

THE DOCTOR AND THE COMMUNITY

In the series of articles on medical practice in America that appeared in our columns last autumn it was pointed out that the relation of the doctor to the community has been much discussed of late in the United States. The report of the Committee on the Costs of Medical Care, which appeared in December, 1932, showed that the great calling concerned with the prevention, cure, or alleviation of disease, which is now one of the largest industries in America, employing over a million persons, presents in striking fashion the characteristics of contemporary industrial depression. On the one hand there are many thousands of skilled doctors, dentists, and nurses who can find no field for their services; and on the other are multitudes of sick persons who badly need those services but are excluded from them by an economic barrier. Any attempt to break down the barrier by means of health insurance, whether based on European systems, or following methods considered to be more in harmony with American conditions, has hitherto been strongly opposed by the more vocal school of medical opinion in the United States as savouring of socialism or paternalism, or other qualities that are deemed to be incompatible with the individualism of the American character. The overwhelming public response to Mr. Roosevelt's courageous campaign to restore prosperity to his country has, however, made it abundantly clear that the American character, individualistic as it may be, is impatient of methods that are found to be unsuited to modern conditions, and is willing under competent leadership to experiment on a large scale.

Indications of this change of attitude are forthcoming in the discussions at a combined meeting of the American Academy of Political and Social Science and the College of Physicians of Philadelphia, which was held in that city on Feb. 7th, and is reported in the *Journal of the American Medical Association* of March 3rd (p. 697). It appears that in many States of the Union steps have already been taken, both by the lay public and the profession, to explore the possibilities of meeting the increasing costs of medical care by some method of sickness insurance suitable to American needs. In California a commission has for some time been investigating the subject in order to present a report to the State legislature next year. The American Hospital Association has approved the principle of providing hospital services on a group payment basis, and schemes for such provision are being developed in a number of cities. Several county medical societies, chiefly in the West and Mid-west, are organising public medical services to provide treatment on insurance lines. The Michigan State Medical Society, which stands out as a notable pioneer in this field of social activity, has appointed a committee to formulate a practical plan of health insurance and has sent representatives to obtain first-hand information on European insurance systems, especially the British system, which is still much misunderstood in America. It is surprising, for example, to find the editor of the *Journal* reported as telling the Philadelphia meeting that England has been "disturbed for fear that its system of compulsory health insurance would bankrupt the nation as it has already bankrupted the voluntary hospitals."

It seems that in the relation of the doctor to the community, as in other social relations, there will soon be great changes in the United States. They will be watched with interest in this country, where it cannot be said that adequate provision has yet been made for the prevention or cure of disease. Our maternal mortality is still much too high; our health insurance system, useful as it is, provides no specialist services or hospital treatment; and the worker whose earnings place him just above the insurance limit finds increasing difficulty in meeting the expenses of a serious illness.

At a meeting of the Royal College of Physicians of London on Monday last, Lord Dawson of Penn was re-elected President.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Capt. A. R. Schofield is placed on the retd. list.

The following officers qualified at the recent examination for promotion to Surgeon Commander: Surg. Lt.-Comdrs. M. B. Devane, W. Flynn, R. R. Baker, E. W. Barnes, and R. L. G. Proctor.

Surg. Lt.-Comdr. R. R. Baker is appointed to *Curacoa*.

ROYAL ARMY MEDICAL CORPS

Maj. and Bt. Lt.-Col. A. D. Stirling to be Lt.-Col.

TERRITORIAL ARMY

Lt. A. D. Briscoe to be Capt.

R. D. W. Butler (late Cadet Corpl., Oundle Sch. Contgt., Jun. Div., O.T.C.) to be Lt.

ROYAL AIR FORCE RESERVE

Flight Lt. J. P. Hederman is transferred from Class D (ii) to Class D (i).

NAVAL MEDICAL COMPASSIONATE FUND

A meeting of the subscribers of the Naval Medical Compassionate Fund will be held at 3 P.M. on April 19th at the Medical Department of the Navy, Admiralty, S.W.1, to elect six directors of the Fund.

AUXILIARY R.A.M.C. FUNDS

The annual meeting of the members of the Auxiliary R.A.M.C. Funds will be held at 5.15 P.M. on April 13th at 11, Chandos-street, Cavendish-square, W., when the annual report and financial statement for the year ended Dec. 31st, 1933, will be presented and the officers and committee for the current year elected

Col. H. F. Humphreys, T.A., is apptd. Hon. Physician to the King, vice Col. G. L. Thornton, T.A. (Hon. Col., R.A.M.C., T.A.) (retd.).

Col. A. R. Moodie, T.A., is apptd. Hon. Surg. to the King, vice Col. C. L. Isaac, T.A. (retd.).

The Henry Hodgkin Memorial.—The appeal to endow the West China Union University at Chengtu in memory of Dr. H. T. Hodgkin has met with wide response, the sum already contributed amounting to over £1900. The executive committee, of which the Bishop of London is chairman, has decided to close the fund on June 23rd, and to present the money to the governors of the Union University when they meet at Oxford on June 25th. Any gifts to be included in the presentation should be addressed before that date payable to the treasurer of the fund at 2, Eaton-gate, London, S.W.1.

PROGNOSIS

A Series of Signed Articles contributed by invitation

General Principles

Of the three great branches of clinical science—diagnosis, prognosis, and treatment—prognosis is admittedly the most difficult. It is also that about which least has been written and of which our knowledge is least systematised. In the series of articles which begins this week, the prognosis in particular diseases will be dealt with by different writers in detail, but in the present introductory article general principles alone will be considered.

Prognosis, rightly understood, involves much more than an opinion as to whether the patient is going to recover or not—*immediate prognosis*, as it is sometimes termed. It should include a complete foreknowledge of the course the illness is going to take; of the complications which may arise; when, if ever, recovery is likely to take place, and whether it will be complete or whether some permanent disability will be left behind. This is usually termed *remote prognosis*.

A forecast of this kind is required of the practitioner (1) in regard to the expectation of life and health in a presumably sound person, (2) in acute disease, (3) in chronic cases. As the data for a prognosis vary in each of these instances they may be considered separately.

(1) *Health and duration of life of a normal person.*—A forecast of the probable health and duration of life in a normal person is the business of the examiner for life insurance. The factors that chiefly require to be taken into account are the individual's family history, especially as regards longevity; his age, regard being paid to the apparent as well as the real age; his occupation and habits; his state of nutrition, stoutness being unfavourable as compared with leanness; the height of the blood pressure; and the soundness or otherwise of his chief organs. Apart from the chances and accidents of life, however, there is one very important element in such a forecast which it is impossible to assess and that is the individual's "resistance." Is he a person who readily picks up infections and offers poor resistance to them when attacked? No amount of care in physical examination helps here, for robust-looking people are often less "resistant" than the pale and weedy. On the other hand, the experience of the family doctor as to the individual's past illnesses and how he stood them may provide at least some ground for a forecast.

(2) *Acute disease.*—In attempting prognosis in a case of acute disease the first thing to be considered is the inherent gravity of the malady, whether it is, like tuberculous meningitis for example, almost inevitably fatal, or whether it is a self-limited condition such as pneumonia. In the latter case the outlook depends upon whether the patient can be kept alive until the disease has run its natural course. In determining the possibility of this the patient's age may be the most important factor, youth being usually in his favour, especially in most of the acute fevers. A sound condition of the internal organs is also of capital significance and especially the condition of the heart, kidneys, and lungs, in that order. As it is sometimes said, "the patient lives as long as his left ventricle." But it is here, just as in the case of "resistance" spoken of above, that there is a gap in our knowledge. We have, unfortunately, no means of estimating the staying power of the heart until it is tried, and the acquirement of some such means would be a great addition to our prognostic resources. As things are at present we have to depend upon the information furnished by the character of the pulse and how it is affected by slight exertion such as turning over in bed, the pulse-respiration ratio, the blood pressure, and the tone of the first sound of the heart, but it must be recognised that the heart may suddenly give way even when, judged by these criteria, things have been going well enough. As regards the general resistance the patient is offering apart from the heart, we are guided by such well-established clinical indications as the decubitus in bed, the strength of the grip, the timbre of the voice, the moistness or otherwise of the skin and tongue, and the ability to take food. Constipation is usually more favourable than diarrhœa. The mere height of the temperature, on the other hand, is of less moment than the laity usually suppose, especially in the young.

The other great source of difficulty in prognosis in acute disease is our inability always to foresee complications, for the supervention of pericarditis in a pneumonia, for example, or the onset of hæmorrhage in typhoid fever may suddenly alter the whole outlook for the worse. Hence it is always wise to qualify a favourable verdict by the rider "provided no complications arise."

(3) *Chronic disease.*—In estimating the outlook in chronic disease the first point to be considered is again whether the malady is of its nature mortal or whether it admits of recovery more or less complete. In the former case, of which lymphadenoma and some progressive diseases of the nervous system may be taken as examples, it should be possible to state on a statistical basis what is the usual duration of life. It must always be remembered, however, that statistical averages are only of limited value in guiding one to a prognosis in the individual case, for the patient may very well be at one or other extreme of the mean.

In chronic disease not inevitably fatal, chronic pulmonary tuberculosis for instance, the degree of resistance and the recuperative power which the patient is capable of exhibiting are of chief importance in making a forecast, but as these can only be estimated by watching the course of events for a time it is always wise to refrain from giving a prognosis prematurely. The state of the other organs may, of course, affect the outlook in chronic just as in acute disease, and the possibility of unexpected complications has to be allowed for just as much.

SOURCES OF ERROR

Errors in prognosis are unavoidable even by the most careful and experienced, but a chief cause of them is undoubtedly wrong or incomplete diagnosis; this is so obvious as to need no elaboration. Another is the attachment of too much importance to the physical signs and too little to the state of the patient "in himself," and it is here that the experienced nurse often scores over the young doctor. Failure to allow for possible complications as a cause of error has already been mentioned. There are also psychological factors which may distort the judgment, such as refusal to face facts or to admit failure or, more excusably, the very natural desire to "prophesy smooth things" at all costs. These must be guarded against. One must be careful, too, to see that a

prognosis is not a mere guess, but is arrived at only after a careful weighing of all the evidence in the case; even then it is wise not to be too dogmatic in stating it.

Communication of prognosis.—When the doctor has made a prognosis, the question whether he should communicate it to the patient or his friends is often a difficult one. Perhaps it is judicious never to give a forecast unless it is asked for, and even then to speak cautiously but with as much hopefulness as circumstances allow. Where the doctor is quite sure, however, that there is no hope of a favourable issue to the case, it is wise for him to take a relative into his confidence even although he may hesitate to communicate his opinion to the patient himself.

ROBERT HUTCHISON, M.D., F.R.C.P.
Physician to the London Hospital and to the Hospital for Sick Children, Great Ormond-street.

SPECIAL ARTICLES

DEATH-RATES IN GREAT BRITAIN AND SWEDEN

SOME GENERAL REGULARITIES AND THEIR SIGNIFICANCE

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LIEUT.-COLONEL, I.M.S. (RETD.); SUPERINTENDENT OF THE LABORATORY; AND

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THE object of this paper is to draw attention to certain regularities in the vital statistics of Great Britain, and to indicate their possible significance in interpreting the past and predicting the future. For purposes of comparison the vital statistics of Sweden have been examined from a similar point of view, and it will be shown that corresponding regularities seem to exist, though partly obscured by some influence the nature of which we are not in a position to identify.

The raw material of this investigation consisted of the specific death-rates at each period for England and Wales from 1845,[1] for Scotland from 1860,[2] and for Sweden from 1751,[3] these being the earliest periods for which reliable statistics are available. As the effects which it is intended to investigate are the general tendencies, and as emphasis is not being laid on small variations, it has been considered sufficient to use where convenient for the whole population the mean of the figures for males and females respectively, whilst, when the statistics available refer to five-yearly periods of age—e.g., 5–10 and 10–15 years—the simple mean has again been taken as the figure for the 5–15 year period. As only the relative death-rates—that is the ratios—are important, as is shown below, any slight errors involved will in large part be automatically eliminated.

It is to be noted that the English figures are grouped in periods of ten calendar years, 1841–50, 1851–60, &c., and these have been centred for convenience at 1845, 1855, &c. The Swedish figures are similarly grouped in ten-yearly periods commencing with 1751–60 centred at 1755, but in this case the last figure (for 1925) is obtained by taking the average of the three years 1924, 1925, and 1926 as the figures relating to the whole decennium were not readily available. The most convenient Scottish figures [3] happened to be those obtained by taking the averages for three successive years—e.g., 1860, 1861, and 1862, centred at 1861—and there seemed to be no disadvantage in working in this one case with figures arranged on a slightly different basis.

RELATIVE MORTALITIES IN GREAT BRITAIN

In Table I. are shown the specific death-rates per 1000 for each age-period of ten years for the earliest period regarding which statistics are available to us. These we shall refer to as the standard periods.

In Tables II., III., and IV. are shown what we propose to call the relative mortalities for England and Wales, Scotland, and Sweden respectively. These relative mortalities have been obtained by calculating the corresponding specific mortality as a percentage of the specific mortality for the same age-group in the same country in the standard period.

TABLE I.—*Death-rates during the "Standard Periods"*

—	Age-periods.						
	5–15	15–25	25–35	35–45	45–55	55–65	65–75
England, 1841–50 .	7·1	8·4	10·3	12·9	17·0	29·9	63·6
Scotland 1860–62 M. ..	7·2	8·7	10·3	12·3	17·2	29·5	64·6
Scotland 1860–62 F. ..	7·0	7·6	9·6	11·5	14·4	24·9	56·5
Sweden, 1751–60 ..	9·5	7·2	10·5	13·8	19·4	32·9	66·3

M. = Males. F. = Females.

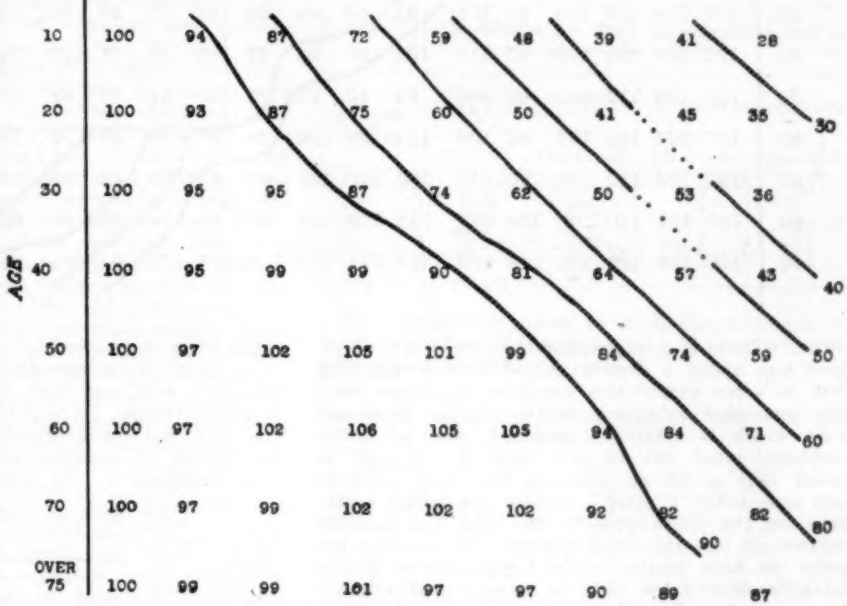
We shall first of all consider the cases of England and Wales, and of Scotland. Superficial observation of Tables II. and III. shows at once that, with the exception of those relating to infants which will be discussed later, there is a general tendency for numbers of approximately the same magnitude to be arranged diagonally in the Tables. In the earlier periods, especially in the case of the higher age-groups, the figures for England and Wales are all in the neighbourhood of 100. In the case of Scotland some of the earlier figures in the later age-groups rise somewhat above 100, the highest being 126·5. It is clear that the fall in mortality has begun at progressively later periods of time with increasing age.

In order to find out the nature of the regularities involved, contours have been sketched out in the figures corresponding to relative mortalities of 90, 80, 70, 60, . . . per cent. It will be seen that these contours show a remarkable tendency to follow the diagonals. Furthermore, it will be noted that the deviations down the diagonals are in general not systematic errors in one direction or the other, but suggest rather the effect of random causes superimposed upon a constant mean. It is now to be noted that a diagonal line in the diagram represents the course of a group of people all born in a particular year. For instance, a person born in 1865 will be 10 years old in 1875, 20 in 1885, 30 in 1895, &c. Thus the figures along a diagonal represent the rates experienced by a particular group (or generation) of individuals all born in a particular year-period, as they pass through successive stages in their lives. The general conclusion then from the diagrams would seem to be that, apart from more or less random deviations, the relative mortality is approximately

constant for each generation at all periods of life. Furthermore, in successive generations this constant relative mortality, characteristic of each, has tended to become lower with succeeding years of birth, until for people born in 1915 it was only 30 per cent. of that of the standard period. We are thus led to a picture of the course of events which is somewhat unexpected in its general outline. It would seem that the actual calendar year is of relatively little importance in determining the improvement in the specific death-rates. What is of importance is the year of birth of the generation or group of individuals under consideration. Each generation after the age of 5 years seems to carry along with it the same relative mortality throughout adult life, and even into extreme old age.

TABLE II.—*England and Wales: Relative Mortalities.* (The figures in the zero row refer to deaths under one year per 1000 births.)

AGE	1845	1855	1865	1875	1885	1895	1905	1915	1925
0	100	101	101	98	93	101	83	65	46
10	100	94	87	72	59	48	39	41	28
20	100	93	87	75	60	50	41	45	35
30	100	95	95	87	74	62	50	53	36
40	100	95	99	99	90	81	64	57	43
50	100	97	102	105	101	99	84	74	59
60	100	97	102	106	105	105	94	84	71
70	100	97	99	102	102	102	92	82	82
OVER 75	100	99	99	101	97	97	90	89	87



It will be seen from Table III. that these results are equally true of Scotland. In this case there is a slight complication due to the fact that in the earlier years there is a small increase of relative mortality in some of the higher ages, but the general tendency of the contours to run approximately along the diagonals is quite unmistakable.

If it be allowed that each generation is characterised by its own relative mortality-rate it becomes of interest to calculate values for this rate corresponding to different years of birth. We have done this by taking the average along each diagonal set of figures and in Figs. 1 and 2 the resulting values have been plotted (Curve A) against years of birth for England and Wales and for Scotland respectively. It will be seen that for England and Wales the curve runs approximately constant at a value of about 100 per cent. until the year 1835, when it begins to fall and continues to drop until for the group born in 1915 it reaches the value of 28 per cent. In the case of Scotland the exact point at which the curve begins to fall is slightly obscured by the fact that a slight rise seems to have occurred with its maximum in 1830. But the fall is well established by 1860, and the rate has dropped to 30 per cent. in

TABLE III.—*Scotland: Relative Mortalities*

AGE	1860	1870	1880	1890	1900	1910	1920	1930
0	100	104.5	97.5	104	102	88	75	64.5
10	100	108	85	69	55	45	35.5	30
20	100	104.5	87	76.5	63.5	47.5	42	34.5
30	100	109	91	86	79	56	50	39.5
40	100	111	98.5	100.5	91	69	59	51
50	100	114	108	115.5	110.5	88.5	73	66
60	100	110	110	126.5	125.5	103.5	91	81
70	100	97	96	110.5	108.5	97.5	90.5	88.5
OVER 75	100	96.5	88.5	98	94	88	90	91

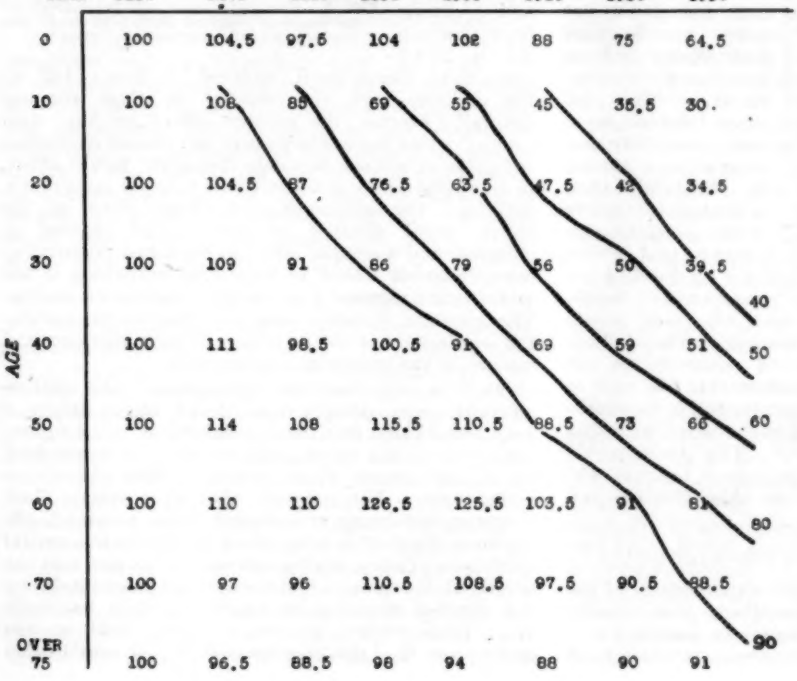


TABLE IV.—*Sweden: Relative Mortalities*

AGE	1755	'65	'75	'85	'95	1805	'15	'25	'35	'45	'55	'65	'75	'85	'95	1905	'15	'25
0	100	106	99	98	96	98	90	82	82	75	72	68	64	54	50	42	34	28
10	100	104	129	114	82	102	81	64	64	64	67	71	67	62	50	38	34	19
20	100	102	122	116	87	118	101	85	85	77	85	75	75	72	76	74	85	55
30	100	103	115	112	86	105	94	90	94	77	80	68	70	62	62	58	67	41
40	100	101	111	107	91	108	104	99	104	88	87	72	67	59	57	52	52	37
50	100	104	112	105	96	118	109	105	109	94	93	79	68	60	56	53	51	43
60	100	101	110	106	104	127	116	109	110	98	99	89	75	65	60	56	55	50
70	100	107	123	122	118	127	123	113	117	110	107	97	84	74	71	65	65	61

50 60 90 80 70

1920. There is a suggestion that the fall in Scotland was about a decade behind that in England, but to some extent this result is dependent upon the somewhat arbitrary choice of the particular year which is taken as standard, and so undue emphasis must not be laid upon it. It will be noted that so far no reference has been made to any ages below 5 years. Neither the infant death-rate nor the death-rates for the ages 1–4, suitably centred, fit into the above scheme. To elucidate the point we have plotted in the Figures (Curve B) the infantile death-rates, that is to say, deaths under 1 year per 1000 live births, for various periods. Both in England and Wales and in Scotland these death-rates remain approximately constant until about 1900, being approximately 150 in the former and 120 in the latter case. The rates shown in the Figures are relative rates, being calculated as percentages of the standard rates—137 and 119·6 per 1000 in England and Wales and in Scotland respectively. The fall since 1900 has been, both absolutely and relatively, greater in England than in Scotland. Clearly if the generalisation suggested above included the infantile death-rates the two curves in each diagram would have been approximately identical. The fall in infantile death-rate was delayed relatively to the expected by more than a generation. In the case of the 1–4 age-group it is found that the fall in its death-rate was also somewhat delayed as compared with that expected, but to a lesser extent. This group would seem to be intermediate in behaviour between the infants on the one hand and the older children and the adults on the other.

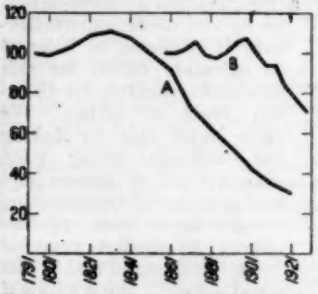


FIG. 1.—England and Wales: mean relative mortalities for various years of birth (Curve A) and relative infantile mortalities (Curve B).

INTERPRETATION OF THE REGULARITIES

We may now consider possible explanations of the regularities which have been described. Two broadly distinct possibilities suggest themselves, namely:

(1) That the consecutive improvements which have taken place in succeeding age-groups are the result of a series of independent sets of conditions, or legislative acts, and that the apparent regularity is largely fortuitous. It might for instance be suggested that early industrial legislation was directed towards the welfare of children, and that at a later date general industrial and social conditions improved, and that older people were last in being affected by industrial and housing changes. It may also be pointed out that some of the virulent infective diseases, such as small-pox and enteric fever, which have both practically disappeared, exerted a heavy toll on the children, and the removal of these diseases naturally exerted the greatest effect on that age-group; whilst the eradication of any disease conferring complete or almost complete immunity would affect, to an appreciable extent, only the younger age-groups. Although the summation of causes such as the above might produce an effect most marked in children, and a smaller effect in the adult population, nevertheless it would be somewhat surprising if the quantitative regularity just pointed out should emerge. The question therefore suggests itself as to whether the regularity has not its source in some more general feature of the population mechanism.

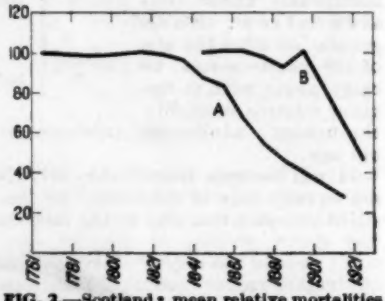


FIG. 2.—Scotland: mean relative mortalities for various years of birth (Curve A) and relative infantile mortalities (Curve B).

(2) It is clear that the regularities in the relative mortality-rates described in detail above imply a very remarkable statistical relationship. The figures behave as if the expectation of life was determined by the conditions which existed during the child's earlier years. For instance, we may postulate that, constant hereditary endowment being assumed, the health of the child is determined by the environmental conditions existing during the years 0–15, and that the health of the man is determined preponderately by the physical constitution which the child has built up. (This remark of course would hold on the assumption that the inherited vitality or constitution

was remaining statistically constant. The question of the effects on the population of selection and other evolutionary processes which would become important when a longer period of time is taken into account are here neglected.) We suggest that this general hypothesis of improved child environment does give an adequate explanation of the observed figures, and we find it difficult to think of any equally satisfactory substitute.

An alternative assumption of a general character might be that a more healthy race of children was born in each successive decade, but apart from the inherent improbability of any substantial improvement in this respect taking place, at least before the development of prenatal welfare work in the present century, the suggestion would seem to be conclusively refuted by the fact that the improvement in the death-rates of children under one year has been considerably less in amount, and much longer delayed in its appearance than the improvement in children of upwards of one year. If the suggestion were true it would be expected that the increased vitality would show itself at least as markedly during the first year as in any subsequent age-period, which it does not.

The anomalous behaviour of this first age-group is, however, consistent with the previous postulate of improved child environment. It has been observed above that the improvement in the infantile death-rate became apparent only after 1901. If we remember that before birth and during its first year of life, the child is dependent for its welfare to a very large degree upon the general health and vitality of the mother, then it would be expected that a substantial improvement in the health of the latter would show itself in a reflected improvement in the infantile death-rate. The mothers of 1901 would on the average be born about 1870 or possibly a little later, and, as mentioned above, the health of females born at that date had so far improved that the death-rate was reduced by about 30 per cent. in the case of Scottish and by about 40 per cent. in the case of English mothers. It is suggested that this may constitute at least one of the factors conducive to the improvement of infantile mortality in the present century.

It will thus be seen that all the figures are consistent with the hypothesis that the death-rates of the adolescent and adult depend on the constitution acquired during the first 15 years or so of life, and that this constitution has undergone a very substantial improvement, presumably as the result of the general raising of the standard of life, and the amelioration of social conditions. If the above hypothesis be correct it would be implied that the decreased death-rates were in fact largely the result of the improved physique of the population.

PREDICTION OF FUTURE MORTALITIES

A very interesting question and one of considerable practical importance now arises. It is clear that if the above generalisation can be extrapolated into the future, then predictions of the decreases of the death-rates at the various ages are possible. In other words, if we assume that the diagonal law is essentially true it becomes an easy matter to predict death-rates for the various age-groups in the future. We simply determine the relative mortality-rate characteristic of a particular diagonal by averaging the rates already available along that diagonal. The specific mortality-rate for a particular age-group at a future time is then found by multiplying the specific death-rate for that age-group in the standard year by the appropriate factor. It is obvious of course that as we go into the future the specific rates for the lower ages cannot be determined by this method. To demonstrate the feasibility of the method we have calculated the specific death-rates for the 1931 period for Scotland from the information available up to and including the 1921 period. The observed and calculated figures are given below.

TABLE V.—*Death-rates for 1931, as calculated and as observed*

Both sexes, aged—	Death-rates compared with 1860–62 (=100).		Death-rates per 1000.	
	Observed.	Calculated.	Observed.	Calculated.
15– ..	34·5	35·5	2·8	2·9
25– ..	39·5	43·5	3·9	4·3
35– ..	51·0	54·5	6·1	6·4
45– ..	66·0	61·9	10·4	9·8
55– ..	81·0	76·5	22·0	20·8
65–75 ..	88·5	91·9	53·6	55·7

By a similar method we have calculated the specific death-rates for 1941 and 1951 on the basis of the information available up to date.

TABLE VI.—*Calculated death-rates for 1941 and 1951 (per 1000)*

Age-periods.	1941.	1951.
15–	2·5	—
25–	3·5	3·0
35–	5·0	4·2
45–	8·4	6·7
55–	17·1	14·4
65–	43·8	38·0

These figures are put forward not so much as definite predictions of the course of events but rather as a simple statement of what will happen if the diagonal lines continue to run as they have been doing during the past 40 or 50 years. It is clearly impossible to assert that this will happen, but if the hypothesis of causation outlined above be accepted as substantially correct, then the expectation that it will happen would seem to acquire a higher degree of justification. As in the case of most empirical statistical results, it is assumed that no abnormal agency of great magnitude suddenly appears. It will be noted that in the relative mortalities for 1910–20 in the English figures certain systematic divergences occur in the mortalities relating to the 5–15, 15–25, and 25–35 age-groups. Detailed examination of the statistics shows that this is accounted for by the abnormal figures of the war years. The Scottish figures do not show this effect because they refer to the periods 1910–12 and 1920–22, and so miss out the war years. On the whole it is surprising, in view of the great changes that have occurred during the period covered by the data, that there is not more evidence of substantial disturbing influences.

RELATIVE MORTALITIES IN SWEDEN

In the case of Sweden the death-rates are available from the year 1750, and so it is natural to turn to the statistics of this country in order to find whether the above generalisation holds for a country other than Great Britain. In Table IV. are shown the relative mortality-rates for Sweden calculated as in Tables II. and III. At first sight it would seem that the picture is quite a different one, but on closer examination it will be found that there is a disturbance limited to a rectangular block dating from 1855 onwards, and affecting the age-groups centred at 10, 20, and 30 years. When this block is omitted it will be found

that the contours run with moderate regularity down the diagonals. The first contour below 100 begins in 1815—that is, refers to persons born in 1805—so that it would seem that the improvement in health began in Sweden at an earlier date than in Great Britain. During the half century previous to 1800, the figures indicate an essentially static state, with fluctuations in which all age-groups tend to be affected proportionally at the same time. We are not sure to what extent those "vertical" changes are real, or to what extent they may have been due to statistical errors, such as wrong estimates of the population. If we assume that the abnormal figures from 1855 onwards are due to some adventitious circumstance at present unknown, we may proceed by omitting this rectangle and use the remaining figures in order to calculate the relative mortality-rates characteristic of each year of birth as we have done above for Great Britain. The result is shown in Fig. 3 (Curve A), which may be compared with

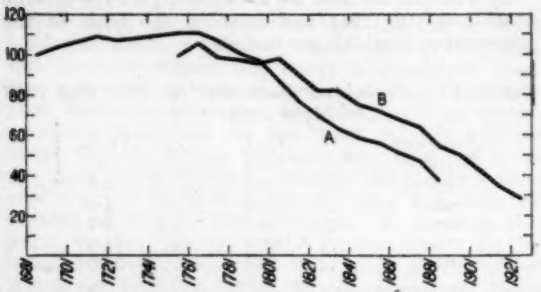


FIG. 3.—Sweden: mean relative mortalities for various years of birth (Curve A) and relative infantile mortalities (Curve B).

Figs. 1 and 2. As in the former cases, we have also shown the infantile mortality-rates (Curve B). In the case of Sweden both mortality-rates began to fall much earlier than in England and Wales and in Scotland, and again the fall in the infantile mortality would seem somewhat to post-date that in the relative mortality-rate, though possibly not in so striking a fashion as in the other countries. The general fall in the relative mortality in Sweden has been progressive but less steep than in the other two countries.

Reference may be made at this point to a paper by Greenwood [4] in which he describes and contrasts the vital statistics of Sweden and of England and Wales from 1850 to 1910. He concentrates attention on the two age-groups centred at 20 and 50, and shows that whereas in the former Sweden started by being better than England and finished by being considerably worse, in the latter the positions were reversed, and England which began superior was in the end definitely inferior to Sweden. If the available statistics are viewed from the more comprehensive point of view suggested in the present paper the same facts take on a somewhat different complexion. The contrast in behaviour since 1850 is seen to depend upon the earlier beginning in Sweden of a less rapid decline in death-rates, combined with the peculiar disturbance exhibited by the lower age-groups from 1855 onwards. Although this paper does not set out to deal primarily with the vital statistics of Sweden, it is suggested that investigation of these from the present point of view may shed light on the causes of the changes which have been going on in that country, and help to focus attention on the really abnormal feature which its vital statistics exhibit.

DISCUSSION

Possibly the most arresting result of the predictions embodied in Table VI. is the suggested substantial decline in the death-rate of that section of the population above 65 years of age. Many may consider that such a reduction is most unlikely and entirely out of harmony with experience up to date. It seems in some quarters to be accepted as a fact that although very substantial improvements have been effected in the death-rates for the age-groups up to 65 or 70, yet for ages above 70 there are no indications that any improvement is likely. That this view is not substantiated by the facts is shown by a consideration of Tables II.–IV. In Scotland (Table II.) the improvement so far recorded is scarcely significant, the relative mortality in the group aged 65–75 having in 1930 fallen to 88·5 per cent., but as the individuals under consideration were born about 1861 a marked improvement would scarcely be expected. In England and Wales (Table III.) the improvement is more definite though still rather small in degree. In Sweden (Table IV.), however, we have for this group a very much more substantial reduction in the relative mortality-rate (a fall to 61 per cent.). The fact that this fall is so much more marked in Sweden corresponds with the much earlier onset of the process of improvement in that country. It is clear therefore that there is no inherent impossibility in the suggestion that the death-rates for these higher age-groups are likely to undergo very substantial reductions during the next few decades. It is generally recognised that with the present distribution of birth-rates and death-rates there will be a steady increase in the percentage of old people in the community, and it is obvious that a decrease in the death-rates in the higher ages, such as these predictions foreshadow, will very markedly accentuate this tendency.

The thorough investigation of the many problems raised in the course of this work will necessarily entail considerable time and labour. Two directions suggest themselves as being most likely to be of use in determining what is the real explanation of these phenomena—first the investigation of the statistics of a larger number of different countries from the same point of view, and secondly the detailed examination of the causes of death at different periods of different age-groups in any one country. Analysis of the Scottish records from the latter point of view is proceeding. It appears desirable that this should be taken up in the case of any other country for which records are available.

It might seem at first sight that our choice of the first period for which statistics were available as the standard period was somewhat arbitrary. It implies for instance that the process of improvement had not yet begun, and though this is fairly obviously true in the case of Sweden and possibly of England and Wales it is more doubtful in the case of Scotland. In the light of our general conclusions it might seem more justifiable to choose as the standard rates not those existing in any one year, but a series obtained by following a diagonal. The resulting series of standard rates so found would involve no assumption as to the steadiness of the conditions existing, except that influences occurring from year to year, such as would seem to exist in the earlier periods in Sweden, would cause greater random interference. This difficulty, however, could be got over by taking all possible diagonals and finding the best fitting set of standard figures by suitable methods of calculation.

In this paper we have not thought it necessary or even desirable to adopt this procedure. Had we done so, it might have appeared to the reader that the resulting diagonal lines were artefacts depending on the circumstance that diagonal arrays were chosen as the starting point. The simple and direct method which we have followed seems to avoid this difficulty. Furthermore, we find that the use of diagonal arrays from the beginning does not in fact substantially modify the final results.

It is our purpose here to emphasise the medical rather than the actuarial interest of the regularities we have been describing, but it is obvious that these results have a bearing on actuarial problems, and it is not surprising that results, related to these, have been arrived at in this connexion, though with a somewhat different method of approach. Reference may here be made to a paper by one of us (McKendrick [5]) in which, from a general schematic representation of the process of population change, and its mathematical treatment, it becomes clear that expectation of life, &c., should be determined from a series of mortality-rates appearing down the diagonals, and not down the columns. In a paper by A. R. Davidson and A. R. Reid [6] emphasis is laid on the necessity of considering the death-rates characterising a generation, that is, a group of people born in a particular year, rather than the mortalities of a particular calendar year, and in the discussion on this paper Mr. A. E. King put forward hypothetically as possibly approximating to the facts, a suggestion which is essentially equivalent to our result. In a paper by V. P. A. Derrick,[7] emphasis is again laid on the advantage of considering generation mortalities and not ordinary mortalities. He shows that much more nearly similar curves are obtained when the variable employed is the year of birth and not the calendar year, and so, approaching the problem from a somewhat different angle from our own, he has arrived at what is substantially the same result. Nevertheless the method of presentation developed in the present paper seems to demonstrate the phenomenon in a more direct and striking manner than any which we have found in the literature, and further, it seems important that it ought to be brought to the notice of those who are concerned with the health services of this country, whatever be the interpretation which may be given, or the value assigned to it in connexion with the prediction of future events.

From the formal point of view the result is a very simple one. It appears that the specific death-rate is the product of two factors, one of which is a function of the age alone, and the other a function of the year of birth alone.

PRACTICAL INFERENCES

The facts represented in Tables II. and III. with regard to England and Wales and to Scotland are quite indisputable, but we would emphasise that the interpretation given above is in the nature of a hypothesis which fits the facts. If this hypothesis be accepted as substantially correct, it is interesting to note that certain conclusions of great importance from the medical and public health point of view would seem to follow. It would be implied that care of the children during their first 10–15 years of life is of supreme importance. It is at this period of life that improved environment exercises its effect most promptly, and furthermore the improved physique built up during this period would seem to be of decisive effect at all later ages.

At the same time it would be a mistake in the present state of knowledge to push this argument too far and to deprecate care of the adult and to spend all our effort on the care of the child. It must be remembered that the statistics which have been presented are compatible with the existence of secondary factors which may wholly or partly neutralise one another. For example, it seems reasonable to believe that in a favourable environment the standard of health for survival through the younger age-periods would be lower than in a less favourable one. Thus one would expect that a larger number of weaker individuals would go on to the higher age-groups. Nevertheless there is no indication in the statistics that the death-rates in the higher age-groups are adversely affected by the presence therein of those weaker individuals. Possibly the persistence of the favourable environment may counterbalance this effect and facilitate the survival of those weaker individuals so that their presence is not statistically noticeable. Of course the process suggested here is not to be confused with the general hypothesis described above—namely, that good environment in childhood builds up a stronger constitution and raises the standard of physique of the adolescent to a substantial degree. The possibility raised in this paragraph emphasises the importance of maintaining in any modern community good conditions for the adult as well as for the child.

CONCLUSIONS

1. In England and Wales and in Scotland the improvement attained at any particular time in the death-rates of the various age-groups depends primarily upon the date of birth of the individuals concerned, and only indirectly upon the particular year under consideration. An exception occurs in the case of the infantile death-rates, which show definite lags in their dates of improvement.

2. It is shown that these results are consistent with the hypothesis that the important factor from the point of view of the health of the individual during his whole life is his environment up to the age of say 15 years, and that improved conditions at later ages have little direct effect. Improved conditions appear to have brought about their beneficial results primarily through their action on the children.

3. It is suggested that improvement in infantile mortality is dependent in large measure on improvement in maternal health. This, apart from other influences, would explain why the infantile mortalities lagged behind in their fall.

4. The figures for Sweden do not show the same simple regularities, but if a section of the table be omitted (relative mortalities for the age-groups centred at 10, 20, and 30 years from 1855 onwards), the rest of the table exhibits the characteristic features described under (1). It would appear that in the case of Sweden a disturbing force began to operate about 1850 and adversely affected the adolescents and young adults.

5. The facts described under (1), and the hypothesis suggested in (2) direct attention to the importance of good environmental conditions during childhood.

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LONDON'S HOSPITAL DEVELOPMENT

Lord HORDER took the chair at a meeting of the medical staffs of the London teaching hospitals, held on March 22nd at B.M.A. House, to consider the problem of London's hospital development.

Mr. ZACHARY COPE, in opening the discussion, said that it seemed to him lamentable that the teaching hospitals had never yet banded themselves together for coöperation. Pay wards, he remarked, were an accepted fact and were even encouraged by the King Edward's Hospital Fund. In teaching hospitals, however, it was not desirable to diminish the number of teaching beds, and pay wards should not be increased to such an extent as to compete unduly with outside institutions. The principle of the Association that a proportion of the payments made on behalf of patients should be allotted to the staff was, he said, good in theory but not always in practice. Competition between the teaching hospitals and the municipal hospitals of London would in future be very serious. Hitherto the teaching hospitals had encountered no competition and in research had been supreme. They suffered, however, from certain drawbacks: patients often had to wait a long time before they were admitted; in some cases they were examined by a number of students, and some patients might prefer, if they were able to choose, to go to a council hospital if the treatment were of the same standard. He inquired how many students in a teaching hospital received thorough instruction in the treatment of major fractures, many of which were admitted to council hospitals. Moreover, teaching hospitals had such long waiting lists that they could not always deal adequately with abdominal emergencies. A council hospital must accept emergency cases. There was a dearth of resident posts for students at teaching hospitals; on the other hand, council hospitals were often understaffed, and contained a wealth of clinical material.

If it were possible to come to an arrangement whereby the number of residents at the London County Council hospitals could be supplemented by junior men looking for experience at a teaching hospital it would be all to the good. More senior men also should be encouraged to take posts at the hospitals where they would gain experience rapidly. The hospitals would profit by having such first-class men anxious to do research, and the men themselves would gain experience which they would otherwise miss. In a short time the council hospitals would have first-class laboratories and money would not be spared. It was time a committee were formed from all the teaching hospitals to look after their interests and negotiate with the central authority.

Dr. GEOFFREY EVANS said that the past appeal of the voluntary hospitals to the profession and the public had been their services to the poor. Now that there was a prospect that the needs of the poor would be well cared for by the municipal hospitals, the voluntary hospitals might cease to maintain their present eminence and perhaps even to justify their existence, unless they realised that they stood for a principle as important as that of charity—a spirit of freedom and independence in the practice of medicine and an opportunity for education and research. If they made their services efficient they had nothing to fear from the growth of the municipal hospitals, and the public and the profession would gain by the development of both systems. The council had the advantage, especially with its new government, of abundant money for the finance of its hospitals, but this was balanced by the unique spirit of the voluntary system. The voluntary hospitals would hold their own provided their services were improved. This improvement could not be left to the hospitals themselves. They had not taken the great opportunities of the past; they had used extra money to increase the number of their beds, instead of applying themselves to a more efficient use of their present beds. An advisory committee was certainly necessary. Of the available bodies there existed the King's Fund, which was at present chiefly concerned with finance, though it also undertook details of policy and administration; the London Regional Committee of the British Hospitals Association, and the London Voluntary Hospitals Committee recently set up under the Local Government Act, 1929. This body had in the past gone beyond its functions—for instance in arranging for undergraduate teaching in the municipal hospitals; but in the future it might consider itself bound by the statute, which laid down that it existed simply for consultation with the L.C.C. The Association were to be congratulated on calling the meeting, but not on their hospital policy in the main, which took too much account of the interests of hospital staffs and not enough of those of the patients. Any member of the public should have the opportunity of attending an out-patient department with or without a doctor's letter. He suggested that the Association should put the interests of the patient first, bend its energies to the improvement of the voluntary hospital services, and appoint a committee to consider such matters and refer them to the hospitals and to the King's Fund for executive action on the lines foreseen by Lord Cave's committee.

Mr. DUNCAN FITZWILLIAMS reminded the meeting that medical schools played an important part in the hospital system but did not make up the whole of it. The pride of the profession in the voluntary system had gone hand-in-hand with a neglect to study hospital management. Hospitals were governed by the finance subcommittee, which in turn was governed by the amount of its bank balance, and every finding of this subcommittee was passed by the complaisant board. The King's Fund had done most to improve matters; the statutory committee had produced an excellent survey, the British Hospitals Association had done nothing at all, and the only other body, the British Medical Association, had been concentrating on the profits and not on hospital management.

There would be a very strong rivalry between the voluntary and the municipal hospitals. The voluntary hospital had its traditions, its reputation, and the eminent members of its voluntary staff. The municipal hospitals had unlimited funds. The State would inevitably assume full responsibility for the hospital accommodation of the poorer classes, and when that happened the rich would not support the voluntary hospitals much longer, while the council hospital would gain in popularity among the lower classes. Governments could run hospitals perfectly well, as had been proved in India, and there was quite as much red tape in the administration of voluntary hospitals as there could possibly be under State control. The voluntary hospitals were disfigured by anachronisms such as the practice of allowing patients to die and to suffer the after-effects of an operation in public wards. Teaching material was badly wasted through the existence of many isolated voluntary hospitals close together, and purchases were the more expensive for not being centrally controlled. General

practitioners found it long and wearisome to get a patient admitted; with hospitals under the council it would only be necessary to notify the central office. Hospitals could not be run efficiently by men in their spare moments. If a body of men were appointed who were not servants of any one hospital, but who would go about the country and the world studying hospital administration, who would set a common aim and standard for all the hospitals of the country and have power to enforce reforms, our institutions would be unrecognisable at the end of ten years.

Dr. G. C. ANDERSON said that he spoke as an individual with a detached view. The voluntary hospitals were, he declared, hampered by their historic development. Originally founded for the sick poor, they could not now provide the best type of service for the bulk of the community. The original voluntary principle had been largely destroyed by the rapid progress of scientific medicine. The voluntary hospital had become a laboratory, and the criterion for admission was now the gravity of the illness or injury. The cost of medical care had tended to increase very rapidly and, although the statement was constantly made that the voluntary system must be preserved, there was probably not one first-class voluntary hospital which had retained the main principles of voluntarism. He wondered how long the medical profession would put up with the present position. So long as the voluntary hospitals' activities depended on donations, so long would it fail to provide what it ought to provide. Hospitals were a national necessity and should be put upon an economic basis. The demand for the medical staffs to perform the essential work of the hospitals for no payment militated against the prospects of a properly efficient hospital, since it limited the choice of the best men. In some industrial or country areas it was impossible for enough men to set up in specialist practice to meet the needs of the population in this way, and those needs were provided as well as possible by general practitioners. The municipal hospitals would grow rapidly and vigorously. Their beds far out-numbered those of the voluntary hospitals, and the attraction of their work had been proved when the recent appointments under the L.C.C. were advertised. In ten years they would compare favourably with and might even excel the voluntary hospitals.

The encroachments on private practice by the activities of local authorities were no greater than the encroachments on specialist practice by the hospitals. If by any chance the income limit under National Health Insurance were increased to £350 a year, the limit under the contributory schemes would also increase, and the medical staffs of the voluntary hospitals would not care to continue their voluntary services for the section of the community which benefited by that increase. The Association would not have been doing its duty in the interests of the public if it had not considered the interests of the profession, and the hospital system must be in accordance with the Association's policy if the interests of both were to be served. The policy was not perfect; it was the policy of the members of the Association, and it was their duty to sit round a table and try to amend it where necessary. The problems affected members of the Association very gravely, but they would affect still more gravely those who came after.

Sir HENRY BRACKENBURY said that at least one half of a committee dealing with hospital problems in London should consist of representatives of the teaching hospitals. London was so important in the hospital world that its problems could hardly be separated from the problems of hospitals throughout the country. The Hospitals Committee of the Metropolitan Counties Branch seemed to be the best and most effective machinery for the general good.

After discussion, amendments proposing to set up a separate ad hoc committee were lost, and a resolution was passed "that the Metropolitan Counties Branch of the B.M.A. be asked to enlarge its hospital committee to 24 members so as to secure that not less than one-half of the members are representatives of the 12 London teaching hospitals."

THE MUNICIPAL HOSPITAL

IN an address which he gave on March 23rd to the section of epidemiology, Royal Society of Medicine, Dr. W. ALLEN DALEY reviewed the four years since the large local authorities had become responsible for the public hospital provision of their areas. He showed first some of the ways in which the new hospital service could be linked up with the older public health service, and then went on to consider the new problems which it brought in its train. The fundamental problem, he said, is how much hospital accommodation is needed for an area and what should be its nature. Enquiry shows that the numbers of beds per 1000 of the population vary enormously from country to country and from town to town. In 1929 the figure was 9·47 in England and Wales, 7·86 in Scotland, 7·45 in U.S.A., 8·05 in Germany, 6·5 in Holland, 2·37 in Poland. In London it was 19·57 (including voluntary hospitals), in Hamburg 13·67, and in Berlin 6·87. Up to a point the demand for admission to hospital tends to grow with the provision of satisfactory accommodation of good local repute. Such factors as housing accommodation, overcrowding, the incidence of endemic or local industrial diseases and the number of motor accidents which occur in the vicinity have to be borne in mind. The extent to which specialisation is possible or desirable depends on the size and nature of the area. In large cities and urbanised areas, much can be done to provide special hospitals—e.g., for chronic skin diseases, chronic eye diseases, ophthalmia neonatorum and congenital syphilis, epileptic colonies, hospital schools, and convalescent homes. Special units are required in only one of a series of hospitals for conditions where special skill is needed or where the equipment is expensive—e.g., plastic surgery, chronic rheumatism, diseases of the thyroid gland, congenital deformities, deep X ray and radium therapy, puerperal fever, and thoracic surgery. A special unit serves to collect clinical material for investigation and research. Special units required for each group of hospitals are maternity, V.D., and tuberculosis wards and a mental observation unit.

It is, Dr. Daley went on, impossible to generalise on the nature and amount of municipal hospital accommodation required for an area. There can be no uniformity for many reasons. One is the number of beds in voluntary hospitals. There was once an impression that while voluntary hospitals had enormous waiting lists the poor-law hospitals had large numbers of empty beds. The position requires a little explanation. A voluntary hospital can decline to accept any patient and does so, naturally, when its beds are full. A poor-law hospital must admit on demand those who are medically destitute, including those sent on from a voluntary hospital, an obligation not removed by "appropriation" of the hospitals. There are high and low tides

of disease and the municipal hospitals must be prepared for the high tide in January to March each year, or when influenza is prevalent. Only in the summer months is there surplus accommodation, when staff are on summer leave and repairs in progress. In certain towns the municipal hospital is then able to deal with the waiting list of the voluntary hospital.

Another problem to be settled is the extent to which the pressure on "acute" hospitals can be relieved by convalescent or recovery hospitals in the country or at the seaside. Bed accommodation depends too on the out-patient department. Everyone will agree, Dr. Daly said, that it would be a mistake for municipal hospitals to develop departments on the lines of the large voluntary hospitals with their hundreds of thousands of attendances every year. But out-patient departments have value as diagnostic centres, for special treatment and for continuation treatment. The L.C.C. allows six types of patient to attend :—

(1) Casualties, accidents, and other emergencies.
(2) Continuation or after-care treatment of former in-patients requiring further treatment after discharge.
(3) Consultation concerning patients referred by any duly authorised medical officer of the Council.
(4) Antenatal and postnatal examination and treatment.
(5) Patients entitled to our-door medical relief.
(6) Special examination and/or treatment of cases or classes of cases authorised by the medical officer of health.

Facilities for home nursing would reduce the number of beds required by enabling some patients to remain at home and others to be discharged earlier.

After discussing the care and treatment of the chronic sick, Dr. Daley spoke of the transferred hospital service as a field for investigation and research. The whole public medical service being now under the same control even in the smallest borough, cases can be followed through and clinical research undertaken. There is, he said, much investigation to be done on hospital buildings. Have we yet designed the ideal ward block ? What are the proper amounts of wall space and floor space for patients of different types ? A large authority can afford to investigate fully and to experiment for the benefit of themselves and others. Problems of clinical staffing need consideration—the exact rôle of the consultant, the whole-time specialist, the house physician, house surgeon, and clinical assistant. An important question is the training of future medical superintendents. It is wasteful to train a man to be an expert clinician or operating surgeon and then employ him almost entirely in administrative work. There is a tendency for this to happen in areas where the administrative posts are remunerated much more highly than the clinical, and the appointment of whole-time specialists at salaries which compare with those of administrators is worth considering.

In his concluding remarks Dr. Daley spoke of the effect of the Local Government Act on the progress of preventive medicine. Curative medicine, he said, is often regarded as a more attractive study than that of preventive medicine. The arrested epidemic does not stir public opinion. Little notice is taken of a gradual reduction in the incidence of, or death-rate from, any particular disease. There is a danger of becoming so immersed in the absorbing problems of administering hospitals and curing disease as to forget the primary function to preserve health and prevent disease. As a corrective, the cost of hospital treatment brings home to local health authorities the enormous burden on the community caused by ill-health. Once the immediate difficulties incidental to the transfer of such a complicated piece of administration have been overcome, it will, said Dr. Daley, be our bounden duty to try to ascertain what are the preventable conditions which are filling our hospitals, and what steps can be taken to combat them. The stage when these investigations will commence need not be much longer delayed.

MEDICINE AND THE LAW

The Importance of X Ray Examination

Mr. Justice Swift, sitting without a jury, decided against a medical practitioner at Manchester assizes on the 19th inst in a case which gives a good guide as to the judicial attitude towards negligence. Mrs. Medcalf, during her annual spring-cleaning a year ago, injured her foot when a ladder collapsed under her. Her husband's medical attendant was called in ; he thought a bone was broken, and advised an X ray examination at the hospital next day. At her request a private radiological examination was made ; the radiologist sent the prints to the doctor with the observation that there was no fracture of the ankle. In the circumstances the doctor treated her as for a severe sprain. Swelling persisted, however ; an insurance agent, who happened to be also a St. John's Ambulance man, advised the patient that a bone was broken. Subsequently at the end of July she went to the infirmary on the defendant doctor's recommendation, and she was there informed that a bone was broken. She saw a specialist, who reported that nothing could now be done. Complaining that she had suffered a permanent disability through her medical attendant's negligence, she sued him for damages. According to her statement she now walked with a limp and required the aid of a stick. There was some slight conflict of evidence, the plaintiff saying that the doctor urged her to persevere in the use of her foot in spite of the pain, while the doctor said he advised her to remain in bed but she replied she could not because she had her family to look after. As the case proceeded the judge observed that the main issue was whether the doctor was correct in stating that he told the radiologist to X ray the foot, or whether the radiologist was right in stating that he was told to X ray the ankle only. There was medical evidence, perhaps not convincing to the court, that the treatment would not have varied if the information as to the broken bone had been available at the outset. Mr. Harry Platt, consulting orthopædic surgeon, approved the treatment and considered Mrs. Medcalf had made a very reasonable recovery from a very uncommon fracture which the ordinary general practitioner might not see once in ten years. The judge, however, took the view that an ordinary general practitioner would have been able to find out whether a bone was broken or not. If he could not tell with his own eyes, he ought to use the modern resources of science and "have the limb X rayed from the toe-nail to the knee" to make sure that nothing was left unobserved. Apparently, said the judge, the medical practitioner asked only for X ray examination of the ankle, and that was all he got. He did not go far enough, though this was the only complaint of his treatment of the case. If he had applied his mind to ascertain the trouble, he could hardly have failed to find it out. Judgment was given for the plaintiff for £200 with costs.

This was fortunately not a case where negligence could be alleged in respect of the failure to use radiography in diagnosis. It was rather a misunderstanding as to the area of examination—a matter which practitioners must evidently take special precautions to avoid.

CORRESPONDENCE

ADENOID AND TONSIL OPERATIONS

To the Editor of THE LANCET

SIR,—May I reply to some of the correspondence arising from my article of Jan. 20th on methods to diminish the number of tonsil operations. It was not I that on this occasion was "ventilating the question" (Mr. Norman Patterson, Jan. 27th). That was 20 years ago. This time the Fellowship of Medicine did so by a meeting that even drew forth a leading article in the *Times* (Jan. 10th). At it the opinion that operations on tonsils were excessive in number was held by the majority. My article was designed to help those who wished to convert this opinion into practice.

First, let me controvert the idea that is inherent in two letters (Messrs. Hamblen Thomas and Worthington, Feb. 3rd) that we must refrain from expressing opinions in a medical journal because they may be copied into the lay press. The former says he cannot give the public "the other side of the picture, which is the true one," and yet I feel sure that your columns would be open to Mr. Hamblen Thomas as much as to me. I am prepared to leave the decision as to truth to posterity. Again Mr. Hamblen Thomas says my article will cause the public "to get an exaggerated view of the dangers of tonsil and adenoid operations." I do not believe it. They are much more likely to do so by learning from neighbours of the loss of their child from septicæmia or from an attack of measles or diphtheria following the operation. It may be true that in comparison with the number of operations performed these lethal complications of tonsillectomy are rare. Suppose it be one in ten thousand, then by refraining from performing ten thousand operations the medical profession has saved a child's life.

Let us go further into this question of complications. I am interpreted as saying that they are numerous in proportion to the number of operations done. I have never said so because I have no means of knowing what such a proportion is nor of what it should be. What I have said is that "the operation for the removal of tonsils has a greater number of complications . . . than any other operation of the same magnitude," and this I believe to be true. The mere fact that the list can be subdivided into those involving (*a*) life, (*b*) immediate illnesses, and (*c*) post-operative impairment of function suggests that this is so. Then there is the suggestion so often put forward that all complications of this operation are due to bad operating. This is a most improper view. Of course those who operate perfectly will, other things being equal, have fewer complications than those who do not. That is common to all operations and can only be excluded by the perfect operator living for ever. But I believe that in this operation more complications result from operating at the wrong time than from operating badly. It is the judgment when to operate upon which I would lay stress. And there is another factor to be considered.

The operations of surgery may be grouped primarily into two classes so far as complications are concerned. Those in which they may be assessed in relation to the seriousness of the lesion and those in which they cannot. There are operations in which with all care of selection and with the best skill of technique complications will arise. They seem to stab one in the back, and when you have thought it all over there is nothing that you feel you might have done or might not have done that would have caused the result to be different. And of this group the tonsil operation is an outstanding example. I have already mentioned measles in my article. I used to teach that diphtheria after the operation of tonsillectomy was unknown. It is not so. Three years ago I lost a case. Scarlet fever is not so serious, but it is an anxious complication, and as it may arise, I believe, from the patient's own organisms it cannot entirely be preventable. A worse complication than scarlet fever is when this disease is diagnosed when not present and the patient is sent to a fever hospital. The diagnosis is there accepted provisionally, and valuable time is lost if some surgical complication is the true cause of the untoward symptoms. One of the worst cases of suppuration in the lateral sinus that I have ever seen came in this category. Thrice have I known of cavernous sinus thrombosis following the removal of adenoids, and I have no reason to suspect that the operation was improperly performed in any of the cases. Two years ago I feared that the same had happened to a case of my own in which I felt confident that I had used no undue force. The temperature rose to 104° F. and the child developed septicæmia with hæmolytic streptococci in the blood stream. This subsided after fixation abscesses had appeared in the medial end of the right clavicle and in the hip-joint. If Mr. Patterson (Jan. 27th) and all those who speak and write as though "in the hands of those possessing an average amount of skill serious complications, immediate or remote, are so rare as to be almost negligible," has never had such a case it is their fortune rather than their skill, and I can assure them that, however rare, such things are never "negligible."

Let me now turn to two points of phraseology in the letters. Mr. Worthington says (Feb. 3rd) that my statement that the operation is never "absolutely necessary" is untrue. But he uses the phrase in a sense that is different from the definition I gave of what I thought should be its surgical interpretation. Then Mr. Denis Browne (Feb. 17th) thinks I am "indignant." I can assure him I am not; neither with a general surgeon nor with any other medical man for removing the tonsils "of such of their cases as they consider need operation." If he is competent any registered practitioner is entitled to do so. I plead for a careful selection of cases and for the conservation in every case of such lymphoid tissue as does not need removal. It is with sadness rather than with indignation that I believe this selection and this conservation to be less rigid in the hands of the general than of the specialist surgeon. I plead for a wide outlook into the problem, and would point out to Mr. Denis Browne that the principles of surgery are the same whether the operator is ubiquitous in his activity or has confined himself anatomically to a limited area of the body.

Lastly, may I say a few words on sinusitis in childhood (Mr. Norman Patterson, Jan. 27th; Mr. Hamblen Thomas, Feb. 3rd; and Mr. Deighton, Feb. 24th), as I fear that a diminution in the removal of tonsils may be followed by a spate of operations upon the sinuses if the views on sinusitis in childhood that are being put forward to-day gain ground. In the first place, sinusitis in childhood is not a disease by itself but a part of a rhinitis, or rather of a general infection of the upper respiratory tract. It is but seldom that the localised suppurative type —to which it would be well to limit the term—occurs

at this age. In the second place, I know of no criteria applicable to children upon which the accurate diagnosis of this localised suppurative sinusitis can be based. It is only when the inflammation has spread into the orbit and formed a swelling there that I feel certain of its existence. In the third place—and this is fortunate—it does not matter if one cannot diagnose it, for the treatment thereof is the treatment of the rhinitis of which it is a part. It is important to remember this difference. In the adult to cure the rhinitis one tackles the sinus. In the child to cure the sinus one tackles the rhinitis. The difference is probably anatomical, but one cannot too strongly enunciate the principle that except to make a snick into an orbital swelling when pus is persisting one should not operate upon the sinusitis of childhood. The treatment is to remove the nasal discharge by mechanical means, such as nose-blowing and saline washes with a syphon-douche, and then to rely upon the *vis medicatrix naturæ* by increasing the respiratory exchange, firstly by breathing exercises, and secondly by other exercises such as skipping, running, and jumping. In this way also will the circulation through the mucous membrane of the nose and its sinuses be increased better than by any other. Vitamin A, in the form of cod-liver oil, and sunlight—the real article if possible, even if the air is crisp, but, failing that, the arc lamp as a *faute de mieux*—are accessories of great value. For these reasons I do not feel that a trained rhinologist capable of excluding nasal sinusitis is the only person who can decide whether tonsils should be removed. If the other person remembers the possibility of the sinusitis and leaves the tonsils alone, it does not matter much whether he knows exactly which of the various cells is or is not involved. In fact, I think it better not to attempt to know. One is saved the temptation to make more holes into them.

What is the age at which the change over in sinusitis occurs? I do not know. It is certainly after the eruption of the 12-year-old molar, and probably after the development of the face and pharynx that occurs at puberty.—I am, Sir, yours faithfully,

London, March 24th. T. B. LAYTON.

THE BARBITURATES

To the Editor of THE LANCET

SIR,—May I add to the concluding phase of this controversy? And before dealing with the general aspects I would point out that there is one sentence in Sir William Willcox's last letter which shows how involved the medical position has become. He says that his remarks at the discussion before the Royal Society of Medicine were not intended to apply "to the use of luminal for epilepsy for example." But how is the chemist to know that any given prescription is for an epileptic? Are medical men to be directed under statutory obligation to vary their manner of prescribing according to the disorder for which they prescribe? Luminal in small doses is not only given for epileptic states but may be equally valuable in the control of certain mind disturbances. Is the one to be treated freely and the other under restriction?

Every medical man is aware how legal restrictions have long embarrassed the early treatment of mind disorder, and now it is being urged that the therapeutic treatment should also be regulated by statute. Let any medical man read carefully all the correspondence of the past weeks and judge whether he can whole-heartedly say that a case for such interference has been established, and that the public are in danger under present conditions. Granted that the public have become alarmed as to the present position, it must not be forgotten that part of this alarm has been due to the quoting of papers which have not stood the test of critical investigation.

Those of us whose work brings us into contact with varying degrees of mind disorder, and where suicide and attempted suicide are alas too common, would welcome anything which would prevent such things happening. But does anyone who has experience in mind disorder believe that the suicide-rate will be reduced by the restrictions suggested? In my opinion it may be increased, for some unhappy persons with suicidal intent will then turn to other methods of self-destruction which may be less amenable to medical aid. But what to me is the greatest danger of all is that the effective treatment of sleeplessness will be lessened with disastrous results, not the least of which will be an increase in the number of suicides.—I am, Sir, yours faithfully,

East Preston, Sussex, March 24th. MAURICE CRAIG.

"BRASS-WORKERS' AGUE"

To the Editor of THE LANCET

SIR,—On p. 653 of your last issue reference is made to a case of chronic brass poisoning, reported by Dr. Bernhard Pfeiffer, of Transylvania. The exact occupation of the worker is not given, but seeing that he suffered from "brass-workers' ague" it is presumed that he was a brass caster. The manipulation of brass or copper in the cold does not, as far as I am aware, give rise to any symptoms. May I point out that it has been well established that the attacks of "ague" are due to the fumes of zinc, which is an essential component of brass. I described in the annual report of the Chief Inspector of Factories for 1921 (p. 70) typical cases of ague (so-called brass-founders' ague) affecting men cutting up galvanised (zinc coated) plates by means of an oxy-acetylene flame. No question of brass or copper arises in such cases. The condition is an acute one and leaves no after-effects (see report of the Departmental Committee on Compensation for Industrial Diseases, 1907, p. 6, Cmd. 3495).

I am, Sir, yours faithfully,

JOHN C. BRIDGE,
H.M. Senior Medical Inspector of Factories.

Factory Department, Home Office, S.W., March 24th.

PLASTIC SURGERY CENTRE PHOTOGRAPHIC RECORDS

To the Editor of THE LANCET

SIR,—As surgeon to the L.C.C. plastic surgery centre at the Hammersmith Hospital, and as the person entirely responsible for the development of the special photographic apparatus employed there since the department was opened, I take the strongest possible exception to the final paragraph of the annotation on p. 468 of your issue of March 3rd. To suggest that variation in background has been employed as an "artifice to enhance the result" of treatment is to impute a despicable dishonesty of which plastic surgeons in this country have never been guilty. The apparatus is designed to produce strictly comparable case records, distance of subject from camera, quality, quantity, and direction of illumination, exposure, and stop all being standardised. It is unfortunate that delay in the provision of a suitable background of neutral tint should have allowed the difference noted by your annotator to appear in records chosen for report. The criticism is ill-founded however; for nose results, being chiefly

matters of contour, frequently show up infinitely better against a black background than against the white one which it is suggested was chosen to enhance them.—I am, Sir, yours faithfully,

T. POMFRET KILNER.

Harley-street, W., March 23rd.

*** The emphasis was on the desirability in all cases of similar back-grounds being employed in pictures provided for comparison. It was not intended to attribute in the particular pictures the employment of artifice to enhance results, but only to indicate that where back-grounds are dissimilar results cannot be truly compared.—ED. L.

BABINSKI'S SIGN IN DIPHTHERIA

To the Editor of THE LANCET

SIR,—In an annotation on p. 642 of your issue of March 24th I am reported as saying (at an R.S.M. discussion) that a Babinski type of plantar response was of no significance, as it occurred at some period of the disease in most acute cases of diphtheritic neuritis. What I did say was that I had found an extensor plantar response in 172 (19·6 per cent.) of 877 cases of diphtheria, that it was essentially a phenomenon of the acute stage, that it was most frequent and persistent in severe forms of diphtheria, and was probably due to a transient perturbation of the pyramidal tract. Further details can be found in my paper on Babinski's sign in diphtheria (Rev. Neur. and Psychiat., 1910, viii., 404).

I am, Sir, yours faithfully,

J. D. ROLLESTON.

Western Hospital, S.W., March 24th.

DIAPHRAGMATIC HERNIA IN AN INFANT

To the Editor of THE LANCET

SIR,—I was much interested in the communication in your last issue (p. 628) by Dr. G. H. Greenway. I published notes on a similar case (Brit. Med. Jour., 1932, ii., 794) in which however symptoms first occurred within 24 hours of birth and the infant died within 36 hours. The nature of the hernia in Dr. Greenway's case was very similar to mine; his contained small and large intestine, mine small intestine and cæcum, the diaphragmatic apertures were similarly situated, and although Dr. Greenway does not make special mention, there would seem to be in his case as in mine no peritoneal hernial sac. In my case I was led by the physical signs to believe that at birth, and for some hours after, herniation had not taken place to any extent, and that the process was progressive and caused more by respiratory effort than by feeding, since lactation had scarcely commenced by the time the baby died, although it had been put to the breast regularly in the usual manner.—I am, Sir, yours faithfully,

Redhill, Surrey, March 23rd. L. J. BARFORD.

STREPTOCOCCAL SEPTICÆMIA

To the Editor of THE LANCET

SIR,—While agreeing in the main with your leading article of March 10th, I should like to make the point, which I think your article rather obscures, that in certain cases—such as that of Mrs. T., in which antiserum was given from the beginning without effect—antiserum appears of little avail. It is in such cases that the laborious method of transfusion which I described seems to offer the only hope. The giving of such serum as a prophylactic in the case of Mrs. T. was of course impossible because the first symptoms were those of a fulminating septicæmia.

I am, Sir, yours faithfully,

Montpelier-row, S.E., March 25th. C. B. DYSON.

A FUNDAMENTAL PRINCIPLE

To the Editor of THE LANCET

SIR,—It is difficult to estimate the debt that our profession owes to the School of Medicine of Vienna. There must be doctors in every quarter of the globe who, like myself, are compelled gratefully to acknowledge that they are doing better work to-day both on account of the discoveries made in that school and of the clinico-pathological instruction given by it. Not a few of us have received innumerable kindnesses in Vienna and made lifelong friends of our colleagues there.

It is accordingly with the deepest regret that we learn that the Dolfuss Government is trying to induce the doctors of Vienna and Austria generally to break what has been recognised from the earliest times as a fundamental principle of medical ethics by compelling them to disclose the name of any wounded they have treated and imprisoning those who refuse.

Cannot we as a profession make some protest against this action? Why should we not carry resolutions in our local medical societies and send them to the Austrian Ambassador? The people of England and Austria are so alike in temperament, and have understood each other's point of view so well in the past, that I cannot fail to believe that the Austrian Government would be influenced by such protests.—I am, Sir, yours faithfully,

SOMERVILLE HASTINGS.

Devonshire-street, W., March 26th.

DRUGS IN POST-ENCEPHALITIC PARKINSONISM.—Dr. M. Schächter, assistant in the neurological department of the Filantropia Hospital, Bucharest, writes to point out that it was his chief, Dr. A. Radovici, who first applied atropine treatment in post-encephalitic parkinsonism and published his results in Rumanian medical literature (1920–25) and in the *Presse Médicale*, 1921 (p. 83) and 1925 (p. 555). His work was confirmed and cited by Prof. C. Achard in his book "L'encéphalite épidémique" (1921). Radovici administers daily 3–6 teaspoons of a solution of 0·001 g. or 0·002 g. atropine sulphate in 150 g. water, a dose which can be given for months or years without giving rise to the troubles of secretion, accommodation, or digestion seen with the big doses advised by Roemer and Kleeman in 1929. Dr. Schächter surveyed the subject in *Strasbourg Médical* for May, 1933.

BATH NOSE, THROAT AND EAR HOSPITAL.—Last year 6000 cases were treated and there were 762 operations; new in-patients numbered 427. The report emphasises the beneficial results of removal of all septic foci in cases suffering from rheumatic conditions.

QUEEN'S HOSPITAL, BIRMINGHAM.—Last year there were 5512 in-patients, and the out-patients, casualties, and massage patients numbered 33,402, a substantial increase. The average number of beds occupied was 282·49, a small increase; the average weekly cost per in-patient rose from £2 19*s.* 6*d.* to £3 1*s.* 7½*d.* The report expresses regret that the students of the University have decided not to hold a carnival this year, the consequent loss of income both to the Queen's and the General Hospital being a serious matter, since "both incur considerably heavier expenditure as medical teaching hospitals than would otherwise be the case, against which the sums received from the carnival were a helpful and valuable set-off." Since the last carnival failed to achieve the anticipated success the students are able this year to present only one bed—the 19th—to the General Hospital, whereas in 1933 they presented three.

IRELAND

(FROM OUR OWN CORRESPONDENT)

THE "CUTS" BILL

THE Local Services (Temporary Economies) (No. 2) Bill, 1933, passed through its later stages in the Dáil last week, and will be submitted for the consideration of the Senate after the Easter recess. Only in one particular did criticism in the Dáil succeed in persuading the minister in charge of the Bill to soften its rigours. As the Bill stood originally the schedule specified certain deductions on salaries which were to be compulsory on local authorities and were to be minimum. While the local authorities could not make smaller deductions they might make greater, subject only to the sanction of the Minister. Moreover, the local authority was to deal with each case individually. These objectionable provisions have been removed from the Bill. The Minister consented to alter the schedule to the Bill so that, instead of laying down certain minimum deductions, it lays down statutory deductions which cannot be varied by the local authority. The Bill is a much less vicious instrument as a result of this concession. Dispensary medical officers are given a certain grace under the Bill. Their salaries are, for the purpose of the Bill, to be calculated as being £50 less than they actually are. This grace is an indirect method of recognising the fact that dispensary medical officers have to bear their own travelling expenses—no inconsiderable item in a country district. The figure of £50 by no means covers average travelling expenses of a dispensary doctor, and an amendment was proposed with a view of increasing the concession from £50 to £150, but the Minister refused the amendment and it was rejected. As the Bill stands, unless amended by the Senate, a whole-time medical officer with a salary of £800 a year will suffer a deduction this year of £24; a part-time medical officer, such as a poor-law medical officer, with a salary of £300, will have the deduction of 5 per cent. calculated on £250—namely, £12 10*s*. A dispensary medical officer with a salary of £260 or less will not be subject to a "cut."

OBITUARY

SIR WILLIAM NORMAN, K.C.B., F.R.C.S. Edin.

SURGEON VICE-ADMIRAL; LATE MEDICAL DIRECTOR-GENERAL, R.N.

WE announced last week the death on Friday, March 16th, of Surgeon Vice-Admiral Sir William Norman; the event occurred at the Royal Naval Hospital, Plymouth, at the age of 78.

William Henry Norman had a naval pedigree; his father was a Fleet paymaster, his grandfather and also two of his grandfather's brothers were naval officers who saw distinguished service. Vice-Admiral Norman was educated at Plymouth and King's College, London, and qualified as M.R.C.S. Eng. in 1878, taking the diploma of L.R.C.P. Lond. later. He entered the medical service of the Navy in 1882, and after filling a post at Haslar was appointed to the *Reindeer*, and following operations for the suppression of the slave trade at Zanzibar was mentioned in despatches for his skilful surgical work. This was in 1887. His next important appointment was to the *Blonde*, and while on board her he took part in 1895 in Admiral Rawson's punitive expedition against rebellious Arabs. Then, as staff surgeon, he took up an appointment on the *Boscawen* training ship, and later discharged duties on the staff of the Gibraltar Hospital and in the Royal Marine Artillery Depôt. He was promoted to deputy inspector-general in 1908 and became surgeon-general in 1913 when he was in medical charge at Plymouth. On leaving this post he was nominated, in 1917, Director-General of the Naval Medical Service with rank as Surgeon Vice-Admiral, from which position he retired in 1919 on age limit.

SIR WILLIAM NORMAN

[Photograph by Elliott & Fry.

Sir William Norman, who filled his distinguished appointments with conspicuous ability, was created C.B. in 1916 and K.C.B. in 1918, and was the recipient of many foreign orders, being a Commander of the Legion of Honour, Grand Cordon of the Sacred Treasure (Japan), Commander of the Crown of Belgium and the Star of Rumania, and the holder of the Distinguished Service Medal (U.S.A.). He was also a Knight of Grace of the Order of St. John of Jerusalem.

Sir William Norman had a very happy period of retirement to Cornwall, for country pursuits had a strong appeal to him. He was twice married, first to Constance, daughter of Mr. Greville Williams, F.R.S., and secondly to Lucy, daughter of Mr. B. Carver.

DR. M. W. SHUTTE

Dr. F. R. B. Atkinson writes: "As a friend for very many years of the late Dr. M. W. Shutte, I should like to add my testimony to the loss Weybridge has sustained by his untimely death. His striking personality will be greatly missed in the neighbourhood, and he will long be remembered for his geniality and cheerfulness, but above all for his many acts of kindness. The sympathies of all his numberless friends will be extended to his wife in the loss of a devoted husband and to his family, bereft of a fond parent."

BURNS IN CHILDREN.—The increasing number of admissions of children suffering from burns or scalds is described in the annual report of Belfast Children's Hospital as "a matter for serious public concern." Last year there were 64 such cases, 18 of which ended fatally, in addition to "large numbers" treated in the out-patient's department. Twenty-nine children were admitted to the wards suffering from injuries, caused by motor accidents some of whom were in hospital for long periods. In the first full working year of the new hospital, out-patient attendances rose from over 46,000 to over 55,000, new cases exceeding 20,000 for the first time. There were 1242 in-patients and 2400 operations.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Slum Clearance and Overcrowding

IN the House of Lords on March 21st the Archbishop of CANTERBURY moved: "That this House welcomes the measures proposed by His Majesty's Government with regard to slum clearance and the evils of overcrowding, and hopes that they will take early steps to secure the effective operation of these measures." The housing schemes and subsidies of the post-war years had, he said, left unsolved the main problems of slum clearance: the provision of houses at rents which the lower-paid workers could afford, and the evils of overcrowding. The first of these great problems had been tackled with great energy by the Ministry of Health in the Acts of 1930 and 1933 and in the Minister's Circular of last April. The White Paper which had just been issued showed that one of the greatest efforts in housing policy which had ever been contemplated was definitely on foot. If this great scheme was carried out there would be a demolition of 266,851 slum houses and the building of 285,189 houses in replacement. That meant that between 1933 and 1938 an average of 248,000 slum dwellers would be rehoused each year. But even if this scheme was carried through there still remained the evil of overcrowding. In London 150,130 persons were living three or more in a room. In 15 large cities (including London) throughout the country more than half a million people were living three or more to a room. The Minister had not seemed to realise fully the gravity of the situation. Certainly the latest proposals of the Government went a very long way to meet the evil which the slum clearance scheme would have left largely unsolved. But he would like the Government to make it plain that the subsidy was not to be confined to urban tenements, but would be equally available for low-rented cottages outside the central areas. Families living in overcrowded dwellings ought not to have to wait year after year before housing schemes could be carried through, and the public utility societies, if they received proper assistance from the Government, could step in and act promptly and effectively. If the local authorities were to be entrusted with the double task of dealing with slum clearance and overcrowding, then the whole forces of the Government would be necessary to see that the performance was kept up to promise.

Lord BALFOUR OF BURLEIGH said that the error of the Government was in thinking of slum clearance and overcrowding as two separate problems. It was a mistake to suppose that they could deal first with one and then with the other. Overcrowding was the reflection of the shortage of houses, and the great difficulty in clearing the slums was due to the extent of that very shortage. The matter when dealt with in that way was not planning—it was patchwork. Had not the time come when slum clearance, overcrowding, real town planning, and garden city development should be taken as a comprehensive whole. If the Government outlined a comprehensive long-term policy for housing the response would be such as to get the thing really on a national basis.

Viscount GAGE (Lord-in-Waiting) said that the new Housing Bill would be introduced at the earliest possible moment that progress with slum clearance permitted. It was proposed to arm local authorities with wide powers to clear properties and carry on redevelopment. The public utility societies would occupy a well-defined place in the new machinery. The Minister of Health was convinced that the local authorities would be able to carry the new responsibilities which would be placed upon them. If overcrowding persisted in rural areas, and if private enterprise showed no signs of remedying it, the Minister had said that it was the duty of the local authority to build houses which they could do without subsidy and without loss. One way of dealing with overcrowding was by means of reconditioning under the Act of 1926. The efforts of the Government to deal with exceptionally bad housing conditions had had a stimulating effect on private enterprise.

The Bishop of WINCHESTER said that the problem of overcrowding was larger than that of slum clearance, and the former was probably responsible for more misery. Private enterprise had completely failed. If the scheme outlined by the Minister of Health was carried out there would be a great reduction in overcrowding. The problem of overcrowding was rapidly becoming so vast that if it went on unchecked much longer if would be impossible for any Government to deal with it adequately.

The Earl of LISTOWEL said that the Government were only touching the fringe of the great problem of inadequate housing, and even if their policy were successful it would have to be carried on much more boldly in the future.

The Marquess of READING said that although he welcomed the new programme of the Government, and would give it every support, he thought that the Government had missed a great opportunity. If they would really rise to the occasion and put forward a really national programme of housing, and give a lead instead of following public opinion, how much better it would be both for the Government and for the country. (Cheers.) Even at this late stage he urged the Government to make an effort to secure national agreement on housing policy and to set up an authority which would really coördinate the national effort to solve a problem which was a national reproach.

Lord MOYNE said this was the first time since the war that there had been a comprehensive attack on the housing problem along the whole front.

Viscount HALIFAX (President of the Board of Education) said that the Minister of Health was now inviting representative associations to discuss with him the form which the measures to give effect to his proposals should take, and he (Lord Halifax) assured the House that the Government were determined that there should be no delay in pushing forward the programme which they had placed before the country.

Methylated Spirit Drinking

On March 23rd in the House of Commons Miss HORSBRUGH moved the second reading of the Methylated Spirits Bill. She claimed that existing restrictions on the use of methylated spirits as a beverage had proved insufficient. In 1924 there were 696 convictions for drunkenness from this cause. Pyridine was then added, and the convictions fell to 441 in 1925 and 389 in 1926. Since then, however, the number had risen steadily and the evil was widespread. The persons charged with the offence were not all addicts; in Glasgow of the 553 people apprehended last year 337 were before the court for the first time. Alcoholic concoctions, including "Red Biddy," although not sold ready mixed, could very easily be mixed by the people themselves. In the present Bill there was no restriction on surgical spirit; when pyridine was added to methylated spirit in 1924 it was found that it could not safely be applied to the skin, and permission was given for industrial spirit to be used medically under a certain formula. Although castor-oil and other ingredients had been added to surgical spirit it was still quite a favourite drink in many places because there was not much difficulty in making it palatable. New formulæ had been introduced as from March 15th, but if they did not make surgical spirit undrinkable she hoped the permit would be removed altogether. She had communicated with medical officers of health, police surgeons, professors, and hospital doctors, and had never yet had the suggestion that the consumption of methylated spirit in its present form was not injurious. Prof. Sydney Smith, of Edinburgh, said:

"It is much more toxic than ordinary alcohol owing to the fact that it takes much longer to be destroyed in the tissues and the effect of one dose may last for several days. One of the most disastrous effects is connected with disorders of vision." Other medical men had informed her that it saps the moral strength and leads to more depravity than ordinary alcoholic beverages. It causes acute gastritis, and in chronic drinkers leads to mental confusion. The Bill proposed that licenses to retail methylated spirit should not be granted unless the retailer had a certificate from the local authority to say that he had been listed as a person who was suitable for the sale and whose premises were suitable. The bottle or other vessel which contained the spirit would have to be labelled, and the seller would be required to enter in a register the purpose for which the spirit was required, and have the register signed by the purchaser, who must be more than 14 years of age. If the Bill became law a great many people would be warned for the first time how harmful it was to drink this spirit.

Mr. HERBERT WILLIAMS seconded the motion for the second reading. He said that he thought that this problem was largely the child of other restrictions. If they could get cheaper gin and whisky a good deal of this problem would vanish.

Sir WILFRID SUGDEN moved rejection of the Bill. He said that he was as sympathetic as anyone with the object aimed at, but he claimed that this measure would make even more acute the terrible evil it was designed to cure.—Lieut.-Colonel APPLIN seconded the motion for rejection.

Mr. HACKING (Under-Secretary, Home Office) said that in 1932, the latest complete statistical year, the number of convictions for drunkenness reported to have been due to methylated spirit drinking was 596. These convictions represented 2 per cent. of the convictions for drunkenness and 0·001 per cent. of the total population, or one person convicted for methylated spirit drunkenness in every 68,000 of the population, assuming that the 596 convictions represented 596 different individuals, which was very unlikely. A very strong case would have to be made out to justify drastic restrictions being placed on the liberties of purchasers and vendors, and he had grave doubts about the effectiveness of the provisions of the Bill.

Sir E. GRAHAM-LITTLE thought that there was no strong medical feeling in the Bill's favour. The medical profession was rightly more concerned with more important poisons which were not restricted by legislation. The objects of the Bill might be attained much more easily than in the way suggested.

The motion was carried by 48 votes to 28, but the SPEAKER intimated that he could not declare that the motion had been decided in the affirmative, since the majority was not large enough to comply with Standing Orders of the House. The debate on the Bill was accordingly adjourned.

Hygiene in Offices

On March 16th, in the House of Commons, Mr. THORNE moved the second reading of the Offices Regulation Bill. He said that this measure was designed to secure that those who worked in offices should do so under proper conditions as regarded sanitation and safety.

Clause 1 provided that offices and rooms must be whitewashed once in 14 months. Clause 2, which dealt with overcrowding, laid down that 500 cubic feet must be provided for each person working in a room, and that if the room was used at night as well as in the day 1000 cubic feet must be allowed. Clause 9 laid it down that no person under 16 should be allowed to work in any office. Other clauses dealt with underground offices where lighting was bad and there was no ventilation of any kind.

Mr. HERBERT WILLIAMS moved the following amendment:—

"That this House declines to give a second reading to a Bill which, however good its intentions, proposes a great mass of needless and fussy restrictions and regulations not calculated to serve any useful purpose."

He said that he did not deny that a great many offices ought to be improved, but the mistake made by its promoters was that they had lifted provisions from legislation applying to factories and workshops, which were necessary in those places, but not in offices.

Mr. LEVY seconded the amendment. He said that the existing Public Health Acts gave full power to the local authorities to deal with premises that were injurious to health. It would appear to be quite unnecessary to lay down a universal prohibition of the use of underground rooms as offices whether or not such rooms were injurious to health. The provisions in the Bill in regard to the changing of air in rooms at least twice in every hour while people were employed there would be expensive and quite unnecessary.

Mr. HACKING, Under-Secretary, Home Office, said that the Bill did not content itself with dealing with matters coming within the scope of the Public Health Acts, that was sanitation and ventilation. It went very far beyond that and dealt with matters such as overcrowding, rest rooms, restriction of periods of employment, periodical returns of persons employed, doors being made to open from the inside, safety appliances, and other matters which came within the purview of the Home Office. The Government had every sympathy with Mr. Thorne's intention, but that was as far as they could go. Local authorities had adequate powers of inspecting offices at present. It was doubtful whether anything more was needed to deal with the regulation of offices than the full application of the sanitary provisions of the existing Public Health Acts.

Sir FRANCIS FREMANTLE said there was certainly serious reason for disturbance as regarded the health of those working in some offices where clerical workers were employed. He went very thoroughly into the matter with the life tables in the census in 1921, and he was given most elaborate figures as regarded the comparative health, firstly, for all cases, and secondly, as regarded phthisis of clerks working in offices.

If they took clerks as a whole at some ages they showed a worse mortality both from phthisis and general mortality than the figures for all occupied and retired males. That would be given by some people as the natural clinching figure, but it was not, because, on the other hand, with regard to the higher ages, from 35 upwards, the mortality, both phthisis and general, of clerks as a whole was considerably better than that for all occupied and retired males. So if they wanted to get at the truth they had to analyse the figures and take them for different classes. The reason for the anomaly was that some clerks were housed in their offices extremely well and others extremely badly. If they took the figures for commercial clerks generally, still more for bank officials and clerks, insurance officials and clerks, and railway officials and clerks, they got different figures. The figures for banks, insurance, and railways were better than for all occupied and retired men, but if they took commercial clerks they got a considerably worse figure. There was very great need for attending to the condition of offices in a very large number of cases.

Some years ago he applied to the then medical officer of health for the City of London, who sent him a memorandum which he had issued in 1913, and also up-to-date figures and experience. It was not enough to say that underground offices were necessarily bad. They could perfectly well make a basement healthy, but it had to be made so. Dr. Howarth's conclusion, after referring to various minor points which required attention, was:—

"This is sufficient to indicate the importance of the subject and, as most workers in the City live outside the City boundaries the responsibility of ensuring that they pass their working life under satisfactory conditions is not one that can be disregarded or passed over lightly."

The war came and put an end to his activities at that time, but the matter was taken up again after the war. The latest available official mortality statistics showed that there was a serious state of affairs. The Government had been asked repeatedly in the House of Commons whether they would introduce legislation for the protection of office workers. As the Government had shown that it was necessary

to take up slum clearance in spite of vested interests, it was equally necessary to deal with conditions in offices.

Dr. O'DONOVAN said that he thought the House and the country owed a debt to Mr Thorne for bringing forward this Bill. It was a pity that there was not the same impulse for the consideration of the environment of office workers when the impulse was felt to improve the conditions of factory life. It could not be said that office workers were exposed to less strain upon health than factory workers. Office workers were not instructed in personal hygiene. The Bill before the House was admirably arranged, though subject to much criticism in detail. If it was submitted to the close consideration of a competent committee nothing but good could result.

The Bill was talked out.

HOUSE OF COMMONS

WEDNESDAY, MARCH 21ST

Road Accidents in London Area

Mr. CADOGAN asked the Home Secretary if he could give any information, from the latest available statistics, as to whether road accidents were still increasing.—Sir J. GILMOUR replied: I have obtained statistics of accidents involving death and personal injury in the metropolitan police district for the months of January and February of this year, and I regret to say that the total of accidents in each of these months is higher than it has been in corresponding months in previous years. I am giving the figures for January and February of the last five years. Figures for this year for the rest of the country are not available, and it must not be assumed that the metropolitan figures are typical of the country as a whole.

Accidents in the metropolitan police district resulting in death and injury in January and February in each of the years 1930–1934 inclusive:—

	Fatal.		Non-fatal.		Total.	
	Jan.	Feb.	Jan.	Feb.	Jan.	Feb.
1930	118	102	3501	2928	3619	3030
1931	86	87	3016	2804	3102	2891
1932	108	91	3361	2873	3469	2964
1933	126	89	2978	2981	3104	3070
1934	109	91	3827	3112	3936	3203

Road Safety Bill

Sir GEORGE HAMILTON asked the Minister of Transport whether, in connexion with his forthcoming Road Safety Bill, he would consider the advisability of making it compulsory for pedestrians to obey traffic signals, whether by light or patrol officer, in the same way as other traffic.—Mr. OLIVER STANLEY replied: The better regulation of pedestrian traffic is a subject which the House will have an opportunity of discussing upon proposals which I shall shortly introduce.

THURSDAY, MARCH 22ND

Control of Dangerous Drugs

Mr. MCENTEE asked the Home Secretary if his attention had been drawn to the facts disclosed in an inquest at Paddington on Saturday last in regard to the accessibility of drugs to the general public of the nitrophenol class; and whether it was proposed to take any action in the matter.—Sir J. GILMOUR replied: Yes, Sir. I have received a report from which it appears that this unfortunate girl died from an overdose of a drug of the class mentioned. The Poisons Board, set up to advise me under the Pharmacy and Poisons Act of last year, is actively engaged in considering the restrictions to be applied to this and other poisons, but meanwhile it is clearly desirable that this drug should be placed under the utmost restriction possible. I am accordingly in consultation with the Lord President of the Council and the Pharmaceutical Society who, until the new Act is brought into force are the responsible authorities, with a view to its being scheduled as a poison at the earliest possible date. I am also proposing to take up the matter with the manufacturers, with a view to the adoption of any further possible precautions.

Sir REGINALD BANKS: Is my right hon. friend aware that the coroner stated that the manufacturers had in fact taken ample precautions against the misuse of the drug by warning on the bottle and otherwise, and that nobody was to blame except the unfortunate young lady who disregarded the instructions?

Sir J. GILMOUR: Yes, Sir. I think that that accurately describes it.

Employment and Health Insurance

Dr. HOWITT asked the Minister of Health whether any statistics obtained from the working of the national health insurance scheme in 1933 showed an increase in employment among insured persons; and, if so, to what extent.—Sir E. HILTON YOUNG replied: An accurate measure of the volume of employment amongst insured persons during any period is afforded by the number of health and pensions insurance stamps sold. An upward movement began in March, 1933, and the figures for the last 10 months of the year show that the number of weeks of employment was about 13,000,000 in excess of the number for the corresponding period of 1932.

Insanitary Conditions at a Mortuary

Mr. THORNE asked the Minister of Health whether his attention had been called to the insanitary conditions of the Cheam mortuary; whether he had received a report from the coroner; and whether any action was to be taken in the matter.—Sir E. HILTON YOUNG replied: The answer to the first part of the question is in the affirmative. I have received no report from the coroner, but I have communicated with the urban district council in the matter.

Dr. O'DONOVAN: Has the right hon. gentleman received complaints that a considerable number of mortuaries throughout the country are in an insanitary condition?

Sir HILTON YOUNG: No, Sir. If the hon. Member has a case in mind perhaps he will bring it to my attention.

Milk Allowances to Children of Unemployed Persons

Mr. HARCOURT JOHNSTONE asked the Minister of Health whether, where under a scale in force for the granting of public assistance or transitional benefit 2*s.* a week was prescribed for each child, it was intended that a public assistance committee should have discretion to give in addition an order for a daily allowance of milk to supplement each child's ration; and whether he would make arrangements to obtain from the Milk Marketing Board a supply of milk for that purpose at the price paid for manufacturing milk.—Sir E. HILTON YOUNG replied: It is the duty of a public assistance authority, in affording relief or in determining an application for transitional payment, to take into consideration the whole needs of the family of the applicant for relief and to make their decision accordingly. Where relief is given, whether in supplementation of transitional payment or otherwise, the authority may include in its grant an allowance of milk for children. As regards the second part of the question, I would refer the hon. Member to the answer given by Mr. Elliot on March 15th (see THE LANCET, March 24th, p. 660).

Biological Research at Southampton

Captain CUNNINGHAM-REID asked the Minister of Agriculture what steps he had taken to assist University College, Southampton, in the biological research work in connexion with the River Avon undertaken by that foundation.—Mr. ELLIOT replied: The Ministry's Director of Fishery Investigations and one of the Ministry's naturalist staff serve as members of the advisory committee formed in connexion with the investigation, and the advice and experience of these officers, and of other members of the technical staff of the Ministry, has been given in a consulting capacity from time to time, both to the University College and to the research officer engaged in carrying out the survey. The Ministry has also assisted the investigation by the loan of scientific apparatus and literature.

Replying to a further question Mr. Elliot said that research work was being carried out by the Freshwater Biological Association of the British Empire at Wray Castle on Lake Windermere. The Association receives financial assistance from the Development Fund. Similar work with reference especially to the pollution of rivers

is carried out by the scientific staff of the Ministry at the Ministry's experimental station at Alresford in Hampshire.

Consumers' Council and Milk Prices

Mr. ROBINSON asked the Minister of Agriculture how many complaints had been referred to the Consumers' Council under the milk marketing scheme; and in how many cases a reduction of milk prices had taken place in consequence.—Mr. ELLIOT replied: The Consumers' Committee for England have been considering the effect of the milk marketing scheme on consumers and in that connexion have examined 29 complaints, which have been made or referred to them. The committee have reported to me, and I am making arrangements for the publication of the report. Effect is being given to the main recommendation of the committee in the terms of the contract recently prescribed by the Milk Marketing Board for the six months' period commencing on April 1st. This is, that the existing arrangements regarding retail prices should be modified by the fixing of minimum margins between wholesale and retail prices, so as to allow for play of competition, while protecting the market against undercutting. The minimum margins prescribed by the Board for regions other than the South-Eastern are 8*d*. in country districts and small towns, 9*d*. in medium-sized towns, and 10*d*. in large towns. In the South-Eastern region the margin is 10*d*., except in rural areas and small towns, where it is 8*d*.

Replying to a further question Mr. Elliot said that the Milk Marketing Board estimated the quantity of milk sold for liquid consumption by registered producers in England and Wales during the period Oct. 6th, 1933, to Jan. 31st, 1934, at about 207,000,000 gallons. This quantity does not include milk supplied by producers who are exempted from the operation of the milk marketing scheme.

Promotion of Prison Hospital Officers

Mr. MCENTEE asked the Home Secretary whether the policy of promoting prison hospital principal officers to the rank of chief officer on the discipline side had been abandoned; the date on which the last promotion was made; and what were the essential qualifications for the promotion of a hospital principal officer to the rank of chief officer.—Sir JOHN GILMOUR replied: The policy of the Prison Commissioners in filling any vacancy in the post of chief officer is to select the officer who appears to them best fitted for promotion, and the qualifications of both hospital and discipline officers are considered. A hospital principal officer has not been promoted to be discipline chief officer since 1924, but since 1928 two posts of hospital chief officer have been created and four hospital principal officers have been promoted to them.

MONDAY, MARCH 26TH

Supply of Milk to Schools

Mr. HARCOURT JOHNSTONE asked the Minister of Agriculture, in view of the necessity of making contracts by April 1st, what arrangements were contemplated or had been made to assist the supply of milk in schools by means of his proposed grant of £500,000; whether the local education authorities were expected to coöperate in this work, and how many local authorities had taken steps in this matter; whether any provision was to be made to guarantee the purity of the supplies; whether it was proposed to distribute the milk in bottles or in milk churns; whether the milk was to be given free of cost to the children, and, if not, what price they were to pay; and, if the price to them was to be reduced, how was payment of the balance of the cost to be arranged.—Mr. ELLIOT replied: As I indicated in the statement which I made on Feb. 22nd, it is for the Milk Marketing Boards in the first instance to frame programmes for expenditure from the milk publicity fund, which must include arrangements for the supply of milk to schools at reduced rates. Pending the necessary legislation, and the submission of programmes by the Milk Marketing Boards, I am not in a position to make any statement on the points to which the hon. Member refers. I would add, however, that there is no reason to delay the conclusion of contracts in the ordinary way for the supply of milk to schools for the summer contract period. It would, of course, be open to the parties to make provision for modification, if necessary, as a result of any programmes that may be submitted and approved.

Slum Clearance and Decanting Accommodation

Mrs. RUNGE asked the Minister of Health whether he was considering the desirability of recommending to local authorities engaged in slum-clearance work in industrial districts the temporary use of public parks and open spaces for providing decanting accommodation.—Mr. SHAKESPEARE replied: The circumstances of different towns vary greatly, but my right hon. friend would give sympathetic consideration to any practicable proposals submitted by local authorities for the temporary use for decanting of parks and open spaces in their ownership.

MEDICAL NEWS

University of London

At a meeting of the senate on March 21st Prof. Karl Pearson, F.R.S., was appointed Heath Clark lecturer for 1934.

University of Leeds

At recent examinations the following candidates were successful:—

M.D.

E. Gledhill (with distinction) and S. Ross.

FINAL EXAMINATION FOR M.B., CH.B.

Part I.—A. J. E. Barlow, T. M. Boyle, Julia M. Brown, D. F. Cameron, G. Clarke, G. A. Collinson, S. C. Crystal, W. G. L. Flather, Irene Haslegrave, J. Holden, E. H. Kitching, E. F. Lai, H. T. Levi, D. G. Liversedge, A. E. Penn, T. W. Percival, F. Reid, H. Silman, R. G. Smithson, H. E. Steward, E. H. Tomlin, and C. C. N. Vass.

Part II.—E. C. Allibone, H. Benn, D. Bickler, G. Cohda, J. H. Crawford, D. H. Drake, F. H. B. Fuller, H. W. Gothard, J. C. Hutchinson, M. B. Khan, N. Lissimore, W. Lomax, O. C. Lord, L. Nagley, A. B. Raper, R. T. Rushton, H. S. Shucksmith, A. Smith, D. Thackray, G. N. Watson, and W. Zemsky.

Part III.—H. S. Shucksmith (first-class honours), E. C. Allibone and G. N. Watson (second-class honours), J. Benn, D. Bickler, G. Cohda, J. H. Crawford, D. H. Drake, F. H. B. Fuller, H. W. Gothard, J. C. Hutchinson, M. B. Khan, N. Lissimore, W. Lomax, O. C. Lord, L. Nagley, A. B. Raper, R. T. Rushton, and A. Smith.

FINAL EXAMINATION FOR L.D.S.

G. B. Ashworth, H. Haworth, J. W. Hobson, H. Kirby, J. F. Russell, W. A. Scholes, and D. W. Smith.

D.P.M.

F. S. Esber and J. S. Johnson.

University of Liverpool

At recent examinations the following candidates were successful:—

D.M.R.E.

Part A.—T. N. Fogarty, J. W. H. Foy, and S. K. Sahay.

D.P.H.

Part I.—T. L. Hughes, H. V. M. Jones, J. A. Jones, F. Langford, E. R. Smith, E. Taylor, and V. J. Woodward.

D.T.M.

A. Ahmed, E. S. Amzalak, A. R. Arulpragasam, J. J. Beausang, P. Y. Chang, F. R. Craddock, A. C. Edwards, T. Foulds, I. H. B. Ghosh, B. A. Hamid, W. Hughes, J. R. Innes, C. C. Ling, J. H. McElney, J. S. McMillan, T. A. Malone, P. J. Purcell, K. S. Tay, and Banoo V. Vakil.

D.T.H.

N. E. W. Anderson, V. B. Athavale, L. C. Feng, L. P. Greson, S. L. A. Manuwa, and C. W. A. de Silva.

Dr. J. R. Innes has been recommended for the Milne medal.

University of Dublin

At recent examinations in the School of Physic, Trinity College, the following candidates were successful:—

M.D.

A. A. Cunningham, Reginald Hegy, J. H. Hodgman, and J. T. Robinson.

FINAL EXAMINATION FOR M.B., B.CH., AND B.A.O.

Medicine.—R. B. Hunter, E. E. O'Malley, H. T. Ryan, Mary E. Mansfield, J. J. Martin, Charlotte F. Pike, H. F. T. Deane, and S. H. R. Price.

Surgery.—James Bell, G. N. Taylor, R. B. Hunter, Agnes Monteiro, W. N. Whiteside, Esther C. L. Howe, Helena G. G.

Bennett, Eva E. Moore, P. A. O'Callaghan, T. J. M. Gregg, J. A. M'Ilveen, and Alphonsus Dolphin.

Midwifery.—J. F. Q. Conolly (passed on high marks), T. D. O'C. Donelan, Eveleen M. H. Scott, Marie J. S. O'Toole, F. J. B. Convery, R. F. Lurring, F. M. Hanna, R. I. Shier, Agnes Monteiro, S. M. Freedman, Joseph Sorett, C. J. Vaughan, and H. G. Ellerker.

D.P.H.

Part II. (*Old Regulations*).—H. E. S. Richards.

Royal College of Physicians of London

At a meeting of the College on March 26th Lord Dawson was re-elected president. Mr. Augustus Andrewes-Uthwatt was appointed junior standing counsel of the College. Dr. H. Morley Fletcher was appointed as representative of the College at the forthcoming centenary celebration of the foundation of the medical school of Liverpool University, and Prof. G. Elliot Smith as representative at the forthcoming international congress of anthropological and ethnological sciences. Dr. F. Dawtrey Drewitt was elected representative of the College on the committee of management of the Chelsea Physic Garden. The Oliver-Sharpey lectures on viruses in relation to the ætiology of tumours will be delivered by Dr. C. H. Andrewes at the College at 5 P.M. on May 1st and 3rd. Diplomas in ophthalmic medicine and surgery were granted jointly with the Royal College of Surgeons to candidates whose names were given in THE LANCET of March 17th (p. 604).

Royal Commission on Durham University

Communications concerning the submission of evidence to the Royal Commission which is inquiring into the organisation and work of the University of Durham, should be addressed to the secretary of the Commission (Mr. S. H. Wood) at Treasury Chambers, Whitehall, London, S.W.1.

Royal Sanitary Institute

A meeting of this institute will be held on Friday, April 13th, at 5 P.M., in the town hall, Bolton, when Dr. R. M. Galloway, the medical officer of health of Bolton, will open a discussion on public baths in relation to health and disease. Following this, a discussion on the technique of re-housing from slum areas will be opened by Mr. Cyril H. Walker, the housing director of Bolton.

Centenary of University College Hospital

In presenting the one hundredth annual report at the annual meeting last week, Sir Herbert Samuel, the chairman, pointed to two outstanding needs—the provision of adequate accommodation for the infant welfare and antenatal departments, and pay beds for persons of limited means. It is therefore proposed to celebrate the centenary by raising £100,000 for the erection of a new building for these purposes. Towards this object Mr. F. W. Hampshire has promised £5000 a year for seven years. In 1933 there were 8624 in-patients and 78,560 out-patients. An inquiry and timing system has enabled out-patients to be attended to without undue delay.

Approaching Centenary of St. Mark's Hospital

The Lord Mayor of London, in presiding at the ninety-eighth annual meeting of the governors of St. Mark's Hospital on March 22nd, said that during the last year over 1200 operations had been performed. The income had just exceeded the expenditure, but the surplus was more than accounted for by legacies, an uncertain source of income. To celebrate the centenary of the hospital's foundation, it was proposed to increase the number of public beds, to build a nurses' home, to provide a self-contained paying patients' block, to instal a second operating theatre, and to improve the cancer research, X ray, and out-patients' departments. The cost of these extensions would be £60,000. The appeal was launched in January, and £2300 had already been received. Mr. J. P. Lockhart-Mummery, the senior surgeon, said that the hospital had the reputation of being the best in the world for its specialty—namely, cancer, fistula, and other diseases of the rectum. One feature of the proposed extension was an increase in the number of private patients' beds, which at present numbered only 12. Dr. A. W. Oxford, the chairman of the committee of management, mentioned that since its foundation the hospital had had as its chairman the Lord Mayor of London.

British Orthopædic Association

This association, under the presidency of Mr. Harry Platt, will hold a spring meeting in Holland from April 12th to 14th. April 12th will be spent with Dr. Murk Jansen at the Anna-Kliniek. On April 13th the members will visit the clinic of Dr. Schoemaker at The Hague, and on April 14th the clinic of Prof. Noordenbos at Amsterdam.

Instruction for D.P.H.

A three months' course on clinical practice and hospital administration will be given at the Brook Hospital, Shooter's-hill, Woolwich, S.E., by Dr. J. V. Armstrong, the medical superintendent, on Mondays and Wednesdays at 9.30 A.M., beginning on April 4th. There will also be lectures on alternate Saturdays. Further information may be had from the medical officer of health of the London County Council, Public Health Department (Special Hospitals), the County Hall, S.E.1.

British Waterworks Association

The summer meeting of this association is to be held at Edinburgh from June 26th to 30th. On the morning of the 27th the subject of The Drought and its Lessons will be discussed on the report of the executive committee; in the afternoon Colonel P. S. Lelean, professor of public health in Edinburgh University, will read a paper on Chlorination of Water Supplies, and Mr. John Bowman, M.I.C.E., a paper on the Consumption, Misuse, and Waste of Water. Visits will be paid on the 28th to various waterworks and reservoirs. The secretary of the association may be addressed at Grand Buildings, Trafalgar-square, London, W.C. 2.

Federation of the Health Resorts of France

The Federation announces the occurrence in the coming summer of two international congresses of high medical interest. First a *Congress on Lymphatism* will be held at La Bourboule on June 9th and 10th. The scientific meetings will take place in the municipal Casino, and discussions have been arranged on the varieties of lymphatism and their origin, on its diagnosis and treatment, and valuable coöperation in the debates has already been secured. Dr. H. Diffre, the treasurer, will supply all information upon the cost of enrolment, and should be addressed c/o The Federation, Tavistock House (North), London, W.C.1.

The second congress, an international scientific *Conference on Rheumatoid Arthritis*, will be held at Aix-les-Bains from June 28th to July 1st. The conference, which will be attended by an important group of medical authorities on the subject from France, Belgium, Spain, the U.S.A., and this country, has been convened in connexion with the inauguration of a new thermal establishment built by the State, and will be held under the patronage of the French League against Rheumatism. Further information can be obtained from the treasurer, M. Dussuel, 1, Rue du Casino, Aix-les-Bains (Savoie), France.

Tuberculosis Association: Annual Dinner

By kind permission of the Master and Fellows of Sidney Sussex College, Cambridge, and with Dr. Jane Walker, C.H., as president and chairman, over one hundred members attended the annual dinner held at the College on March 23rd during the provincial meeting of the Association. The Master, in a welcoming address, said that on the basis of the proverb, "who drive fat oxen should themselves be fat," he should possess, before addressing the Association, special knowledge on the subject occupying the attention, but he had only that which was of common knowledge. He fully realised, however, that public opinion had been greatly changed owing to the anti-tuberculosis work; with the advancement of knowledge and the successful treatment of the disease, it was now no longer dreaded as an invincible enemy. In your president, he said, we have a veteran and pioneer in the movement. Dr. Walker, in reply, drew attention to the great influence on our knowledge of the last three regius professors of medicine at Cambridge. Dr. Vere Pearson, Prof. Joseph Barcroft, Dr. L. S. T. Burrell, and Sir Pendrill Varrier-Jones spoke to the subsequent toasts. In addition to the Master of Sidney Sussex and Mrs. Weekes, there were among the guests Sir Sidney Cockerill and Mr. and Mrs. E. J. Passant.

Epsom College

Lord Leverhulme has been elected president of the College in succession to the late Lord Burnham.

Developments at Torquay

Last week the Mayor of Torquay reopened the corporation warm sea-water swimming-bath which has been refitted and is now equipped with a filtration plant with a three-hour turnover which chlorinates, aerates, and warms the water as it passes through the filters. Torquay is now able therefore to provide covered bathing facilities throughout the year under hygienic conditions. The swimming-bath forms part of the Torquay Marine Spa.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
WEDNESDAY, April 4th.
History of Medicine. 5 P.M. Dr. Dan McKenzie: Euthanasia in the Folk Medicine of Britain. Dr. V. Cotton-Cornwall: Did Laennec Die from Pulmonary Neoplasm?
Comparative Medicine. 5 P.M. Laboratory Meeting at the London School of Hygiene and Tropical Medicine, Keppel-street, W.C.
Surgery. 8.30 P.M. Mr. St. G. B. Delisle Gray: Injection Treatment of Reducible Hernia (illustrated by slides). Mr. R. Atwood Beaver: The Scope of Evipan Anæsthesia.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY.
FRIDAY, April 6th.—8.30 P.M. (at the Hotel Rembrandt, Brompton-road), Discussion on the Future of Nursing-homes and Private Wards in Hospitals, to be opened by Mr. B. Sangster Simmonds and Dr. Edward Gregg The discussion will be preceded by a dinner.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
THURSDAY, April 5th.—3.15 P.M., Mr. Kenneth M. Walker: The Dangers and Difficulties of Prostatic Obstruction.

ROYAL CHEST HOSPITAL, City-road, E.C.
WEDNESDAY, April 4th.—3.15 P.M., Dr. Kenneth Harris: Congestive Heart Failure: Early Diagnosis and Treatment.

CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, April 6th.—4 P.M., Mr. N. Asherson: The Treatment of Chronic Otorrhœa.

UNIVERSITY OF BIRMINGHAM.
FRIDAY, April 6th.—3.30 P.M. (at Queen's Hospital), Mr. Bernard Ward: Recent Advances in the Diagnosis and Treatment of Genito-urinary Disease.

GLASGOW POST-GRADUATE LECTURES.
WEDNESDAY, April 4th.—4.15 P.M. (at the Lock Hospital, Rottenrow), Dr. David Watson: Female Venereal Diseases.

Appointments

HARVEY, R. S., M.B., B.S. Lond., has been appointed Hon. Medical Officer in Charge, Infection Clinic, Royal Waterloo Hospital for Children and Women.

Medical Referees under the Workmen's Compensation Act (ophthalmic cases): BAMFORD, C. H., M.B., Ch.B., Circuit 19; and BARTON, M. H., F.R.C.S. Edin., Circuit 20.

Certifying Surgeons under the Factory and Workshop Acts: GRAHAM, M.B., Ch.B. Manch. (Wigan); HUTTON, D. J. C., L.R.C.P. Lond., M.R.C.S. (Sheerness); MACLEOD, I. M., M.B., Ch.B. Edin. (Inverness); MARSHALL, L. R. H. P., M.D., Ch.B. Edin. (Peebles); and TEMPLE, C. N., M.B., Ch.B. Glasg. (Comrie, Perthshire).

Vacancies

For further information refer to the advertisement columns

Bath Royal United Hospital.—Hon. Physician. Hon. Asst. Physician. Hon. Radiologist. Also Hon. M.O.
Birkenhead General Hospital.—Res. Second H.S. Also Cas. O. Each at rate of £100.
Birmingham and Midland Eye Hospital.—Res. Surg. O. £200.
Birmingham, Erdington House.—Jun. Asst. M.O.'s. Each at rate of £200.
Birmingham, Selly Oak Hospital.—Res. Ear, Nose, and Throat Surgeon. £700.
Brighton, Royal Sussex County Hospital.—Hon. Clin. Asst. to Dental Dept.
Burnley, Municipal General Hospital.—Jun. Res. M.O. £150.
Cambridge, Addenbrooke's Hospital.—H.P. and H.S. to Spec. Depts. Each at rate of £130. Also Res. Anæsthetist and Emergency O. At rate of £130.
Cardiff Royal Infirmary.—Radium Registrar. £200.
Cheltenham General and Eye Hospitals.—H.S. £300.
Chester City Hospital.—Res. M.O. £400.
Colchester, Essex County Hospital.—Asst. H.S. £120.
Croydon, Mayday Hospital.—Jun. Res. Asst. M.O. £300.
Derby, Derbyshire Royal Infirmary.—H.S., Ophth. H.S. Also Cas. O. Each £150.
Ealing, King Edward Memorial Hospital.—Jun. Res. M.O. £150.
East Ham Memorial Hospital, Shrewsbury-road, E.—Res. M.O. £200.
Glasgow, Royal Samaritan Hospital for Women.—Asst. Radiologist.
Golden Square Throat, Nose, and Ear Hospital, Golden-square W.—H.S. £100.
Hackney Hospital, High-street, Homerton, E.—Asst. M.O. £250.
Harrogate Royal Bath Hospital.—Res. M.O. At rate of £156.
Hospital for Consumption and Diseases of the Chest, Brompton, S.W.—Second Asst. Res. M.O., and H.P. At rate of £150 and £50 respectively.
Hospital for Sick Children, Great Ormond-street, W.C.—Res. M.O. Country Branch Hospital. £250.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W. Res. H.S. At rate of £75.
Ilford, King George Hospital.—H.S. At rate of £100.
Indian Medical Service.—Commissions.
Leeds, Hersl Moser Hospital, Leopold-street.—Res. M.O. £200.
Leicester, County Sanatorium and Isolation Hospital, Markfield.—Res. M.O. £400.
Liverpool Royal Babies' Hospital, Woolton.—Res. M.O. At rate of £90.
Manchester, Royal Children's Hospital, Pendlebury.—Res. Surg. O. At rate of £125.
Manchester, St. Mary's Hospital.—Three H.S.'s to Spec. Depts. Each at rate of £50.
Merthyr Tydfil Education Committee.—Asst. School M.O. £500.
Mile End Hospital, Bancroft-road, E.—Asst. M.O. £250.
Miller General Hospital, Greenwich-road, S.E.—Hon. Asst. Radiologist. Also Hon. Ophth. Surg.
National Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. and Out-patient O. At rate of £150 and £125 respectively.
Oldham, Boundary Park Municipal Hospital.—Res. Asst. M.O. At rate of £200.
Paddington Hospital, Harrow-road, W.—Asst. M.O. £250.
Princess Elizabeth of York Hospital for Children, Shadwell, E.—H.P. and Cas. O. Each at rate of £125.
Rochdale Infirmary and Dispensary.—Jun. H.S. £200.
Rotherham Hospital.—Cas. H.S. £150.
Royal Free Hospital, Gray's Inn-road, W.C.—Res. Cas. O. At rate of £150.
Royal Masonic Hospital, Ravenscourt-park, W.—Res. Surg. O. At rate of £250.
St. Mary's Hospital for Women and Children, Plaistow, E.—Res. and Asst. Res. M.O.'s. At rate of £175 and £120 respectively. Clin. Assts. to Med. Out-patient Depts. Also Hon. Asst. Surgeon to Ear, Nose, and Throat Dept.
St. Nicholas Hospital, Plumstead, S.E.—Asst. M.O. £250.
St. Peter's Hospital, Vallance-road, E.—Asst. M.O. £250.
St. Thomas's Hospital, S.E.—Physician.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—H.S. At rate of £100.
Southampton Borough Isolation Hospital.—Res. M.O. £350.
Stafford County Mental Hospital.—Temp. Asst. M.O. £400.
Stafford, Staffordshire County Council.—Venereal Diseases Officer. £750.
Stafford, Staffordshire General Infirmary.—H.P. At rate of £150.
Surrey County Mental Hospital Service.—Jun. Asst. M.O. £350.
Swansea General and Eye Hospital.—H.P. At rate of £150.
Wakefield, West Riding of Yorkshire County Council.—School Medical Inspector. £500.

Births, Marriages, and Deaths

BIRTHS

MASON.—On March 19th, at Hampstead, N.W., the wife of F. Courtenay Mason, F.R.C.S., of a daughter.

MARRIAGES

BIRCH—BOLD.—At St. John's Church, Clapham, on March 24th, Charles Allan Birch, M.D., M.R.C.P., to Marjorie, third daughter of Mr. and Mrs. W. P. Bold, of Clapham Park, S.W.4.

MACLEOD—FERGUSSON.—On March 24th, at All Souls', Langham-place, W.1, Alexander Cameron MacLeod, M.B., B.S., F.R.C.S., to Jean Marjorie, only daughter of Colonel and Mrs. A. C. Fergusson, of 1M, Portman-mansions, W.1.

DEATHS

GIBSON.—On March 21st, Henry Christopher Mends Gibson, M.R.C.S., aged 85.

HART-SMITH.—On March 18th, at Dunbrody, Port Hill-road, Shrewsbury, Franke Chamberlain Hart-Smith, F.R.C.S., aged 73.

HOPE.—On March 24th, at King Edward VII. Hospital, Windsor, following an operation, Dr. John Lamplugh Allen Hope, M.R.C.S., L.R.C.P., of Devonshire House, Addlestone, Surrey, aged 67 years.

MORGAN.—On March 20th, in London, Dr. William Pringle Morgan, M.B., B.Ch. Dub., of Sussex Cottage, Seaford, Sussex.

WHELPTON.—On March 19th, at Bromley-road, Beckenham, Edward Smith Whelpton, M.R.C.S., L.R.C.P., aged 76.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

THE "CHILDREN'S MINIMUM"

Sir Hilton Young, the Minister of Health, last week received a deputation from the Children's Minimum Organising Committee, introduced by Miss Eleanor Rathbone, M.P., the chairman. The deputation urged that a scale representing the cost of the minimum needs for the health of families and individuals should be determined, adjustable from time to time and from place to place according to variations in the cost of living, and should be used for the guidance of the authorities concerned in all forms of relief and assistance. At the same time the existing discretionary powers of local authorities to provide milk for children under five and for expectant and nursing mothers should be made compulsory. The deputation also represented that the practice of rebates from rents of municipal houses, in respect of children or of income in proportion to the number of children, should be encouraged among local authorities.

The Minister of Health, in replying, said that the contemplated formation of a new Unemployment Assistance Board would provide a machinery for dealing with the whole problem on a more adequate basis than had been possible in the past. He shared the committee's keen interest in the question of securing the best possible distribution of milk to children and mothers, and he was engaged, with the other departments concerned, in working out the best distribution of the considerable moneys which the Government had afforded to facilitate this. As to the existing powers of local authorities, he felt from experience that pressure where necessary in the ordinary course of administration was to be preferred to turning the statutory power into a general obligation.

On the question of rebates from rents, he would emphasise that local authorities had been given very elastic powers for relating rents to means, but he himself had almost no power of intervention. There was a present tendency to freer experiment among the local authorities and he was watching these experiments with much interest.

NEPHRITIS AND THE TOXÆMIAS OF PREGNANCY

Mr. G. F. Gibberd has lately produced some further figures[1] bearing on the relationship of the toxæmias of pregnancy to nephritis. They are taken from the routine practice of Guy's Hospital and include observations upon 172 initially healthy women who suffered from albuminuria of pregnancy. Of these, 121 have been examined at intervals of from 2 to 12 years after the first toxæmia. No subject was included unless there was positive evidence that she had been free from renal disease before the first toxæmic pregnancy. It was further required that either (1) a pregnancy should be observed subsequent to the toxæmic one, or (2) that a chronic nephritis should develop. This curtailed the original number of cases to 91. These are divided into three groups according to the sequelæ observed. In Group 1, which includes 16 cases, the toxæmia has been followed by chronic nephritis in 13, and there is an element of doubt in the remaining 3. It is interesting that 3 of these are known to have died in uræmia. In no example was the first pregnancy complicated by toxæmia. In Group 2, comprising 35 cases, toxæmia has recurred in two or more subsequent pregnancies without definite clinical evidence of nephritis in the intervals. In 13 of these the toxæmia complicated the first pregnancy. In the 40 cases forming Group 3 the toxæmia only occurred in one pregnancy, and in 25 of these the first pregnancy was involved. In none of the cases in Group 3 has evidence of nephritis been found.

From these figures it appears that repeated toxæmia of pregnancy has culminated in chronic nephritis in 14 per cent. of all cases, while in 44 per cent. toxæmia has been a solitary event without further complication. Gibberd advances his theory of "occult nephritis" to explain the recurring nature of the toxæmia in certain patients, suggesting that such a nephritis is the result and not the cause of the toxæmia. He postulates, moreover, that the nephritis is of such a kind that it may elude clinical detection in the intervals between pregnancies. This is in fact possible but remains to be demonstrated by following up a large number of cases to necropsy. It is impossible to reach any definite conclusion on the facts as they are presented in this paper. Fuller clinical details are needed in all three groups, especially as to the stage reached in child-bearing life. Although Gibberd regards the toxæmias of pregnancy as being all of one kind, it seems a peculiar and possibly significant fact that in all of his cases forming Group 1 the toxæmia and nephritis have followed a succession of three or more apparently normal pregnancies, whereas in 25 of the 40 cases in Group 3 the toxæmia has complicated the first pregnancy. If occult nephritis can evade clinical detection in the intervals between pregnancies it surely can also evade detection before the first toxæmic pregnancy. It may be that such a latent nephritis was present in all the cases forming Group 1, and that the strain of recurrent pregnancies activated it to a point at which it became clinically manifest. It is obvious, however, that there can be no advantage in straining to reach conclusions on this knotty problem at this stage.

[1] Jour. Obst. and Gyn. Brit. Emp., February, 1934, p. 23.

ACTIVE IMMUNISATION AGAINST SCARLET FEVER

As in other countries in Eastern Europe scarlet fever tends to assume a very severe type in Rumania. This is shown by the fact that the case-mortality in 1929 was 7·5 per cent., in 1930 9·5 per cent., and in 1931 13·1 per cent., the last figure being the same as that recorded in the hospitals of the Metropolitan Asylums Board nearly 60 years ago. Shortly before his death Prof. Jean Cantacuzène contributed to the *Bulletin Mensuel* of the Office International d'hygiène publique (1933, xxv., 2112) an account of the use of inoculation against the disease in Rumania. The material employed was anatoxin (toxoid) prepared according to Ramon's method by treating scarlatinal toxin with 36 per cent. formalin, and keeping the mixture for six weeks at 37° C. Three subcutaneous injections were given in doses of 0·5 c.cm., 1 c.cm., and 1·5 c.cm. with an interval of three weeks between the first and second injection, and of a fortnight between the second and the third. The inoculations were carried out on Dick-positive school-children at Jassy and Bucharest with the following results. Twenty-one cases of scarlet fever occurred among 1158 children inoculated at Jassy—a morbidity of 1·8 per cent., as compared with a morbidity of 1·6 per cent. among 2365 controls in the same schools during the same period. In neither group did any fatalities occur. Thus the protective action of the vaccine used at Jassy was nil. At Bucharest 12 cases, one of which was fatal, occurred among 1229 children who had received three inoculations—a morbidity of 0·9 per cent., as compared with one of 0·6 per cent. among 858 children who had been given only one or two injections. During the same period 24 cases of scarlet fever, 5 of which were fatal, occurred among 1291 children in the same schools who had not been inoculated at all. At Bucharest therefore the incidence of the disease was twice as high among the controls as among the fully inoculated. The numbers, however, were not sufficiently large to be convincing. Prof. Cantacuzène came to the conclusion that inoculation against scarlet fever by anatoxin has only a very slight preventive action on the incidence of the disease—at least under the conditions in which it was carried out in Rumania. The final settlement of the problem requires further experiment on a large scale during a severe epidemic of the disease before it has reached its height.

MITRAL DISEASE AND MENTAL DISORDER

IT has been suggested that the presence of mitral disease in certain forms of insanity may have some bearing on the prognosis of the mental condition. In a paper read before the Nottingham Medico-Chirurgical Society on March 14th Dr. H. A. Palmer described an inquiry he has made to test this hypothesis. The investigation was conducted on the assumption that if mitral disease does in fact hinder recovery the incidence of mitral stenosis will be higher among patients remaining in mental hospitals than in patients discharged from them. For the purposes of the inquiry Dr. Palmer confined himself to cases of puerperal insanity, because this group is clearly defined and because the condition has a general tendency to recovery. He found that in 49 cases of puerperal insanity admitted to the Nottinghamshire County Mental Hospital the recovery-rate was about 60 per cent. After allowing for deaths and transfers 13 cases are still in hospital, and of these only one patient has mitral or any other form of heart disease. Within the last three years alone, however, three patients with puerperal insanity and well-marked mitral disease recovered. The average period taken for recovery of the 29 recovered cases was 8·2 months and of the three cases with heart disease 14 months. A similar examination of all the puerperal cases at the City Mental Hospital Nottingham yielded only one further case of mitral disease among 20 patients insane as a result of childbirth. At the Lincoln (Bracebridge) Mental Hospital there was again only one case, and this patient had developed her cardiac trouble after an attack of acute rheumatism since her admission to hospital. No evidence, therefore, was forthcoming that mitral disease interferes with the patient's prospects of recovery. Dr. Palmer pointed out that the series is far too small to permit of deductions about the effect of heart disease on the length of the patient's stay in hospital.

A RANGE OF DIABETIC DIETS

IT is depressing to note from replies to a questionnaire, quoted in the *Health Examiner* for February, that many patients in America still die from untreated diabetic coma, owing to their unwillingness or that of their relatives to allow the administration of insulin, even to save life. The *Health Examiner* is a small monthly publication dealing with "individual preventive medicine," and its February issue is devoted to the Preventive Aspects of Diabetes Mellitus. Much space is allocated to diabetic diets of all kinds used at the New York Post-Graduate Hospital which, though hardly preventive in scope, provide useful material. The diets are easy to understand and are admirably set out; they include a wide range from low-carbohydrate high-fat to the high carbohydrate (250 g.) high calorie diets. Apparently this hospital finds application for all these different types of diet in different cases, but no indication is given in what circumstances their use is recommended. A clever arrangement of the diets permits of their being either accurately weighed by the patients or measured or guessed where this is impracticable or unnecessary.

INFANTILE CONVULSIONS IN FRANCE

THE collective clinical studies conducted by the *Assises Médicales de l'Assemblée Française Médecine Générale* are becoming notable. At the ninth session, held on Jan. 7th in Paris, the results of investigations throughout France into the causation, incidence, and treatment of infantile convulsions were discussed. According to the summary of the proceedings, issued by Dr. Godlewski, infantile convulsions are in many districts less common than they were—a result, perhaps, of education in infant welfare—and according to some of the speakers of a diminution in alcoholism. The association of infantile convulsions with acute gastro-intestinal infections, especially dysentery, was noticeable in several districts, and in others a high infantile convulsion rate was found to coincide with a high helminth rate. The hereditary side of the problem was emphasised by many speakers in the sense that they recognised "l'aptitude convulsive familiale." All agreed that alcoholism and syphilis in the child's ancestry was a contributory factor, another being birth injury; meningeal haemorrhages at birth seem to be diagnosed more often than they used to be. Most of the general practitioners were agreed on the benign character of infantile convulsions and the absence of sequels in most cases, provided the convulsions did not begin within the first three months or after the third year. As to their possible relation to epilepsy in later life, the opinion was expressed that while few subjects of infantile convulsions become epileptics (only from 1 to 10 per cent.) there is a history of convulsions in 33 per cent. or more of all epileptics, these having been from the outset epileptic in origin. As for the treatment of infantile convulsions, lumbar puncture was recommended as being capable of transforming even the most sombre prognostications.

THE CHEMIST'S RECIPE BOOK

FOR many years subscribers have written to the *Chemist and Druggist* for assistance in supplying articles for which they could discover no recognised formulas, and the editor has replied, as he would and should, to these inquiries. In 1898 the editor, Peter MacEwan by name, collected the best replies from some 50 volumes of his journal and concentrated them in a book which has since run through nine editions. The tenth edition, revised and rewritten by the present editor, Mr. G. P. Forrester, had grown to such a bulk that he divided it into two volumes, the second of which is now before us and contains formulas which cannot properly be classed as pharmaceutical. For this reason it covers a wide range of requisites for modern life, and suggests how interesting must be the occupation of the pharmacist who has to deal with them all; perfumes, toilet preparations, beverages, disinfectants, stains and varnishes, inks, photographic solutions—and even after this enumeration the editor has to add the word "&c." The present volume contains 983 pages, all except 50 of which are occupied by the formulas, the remainder by an appendix of weights and measures, a note on the use of methylated spirits for technical purposes, and a very serviceable index. The volume is published at the offices of the *Chemist and Druggist*, 28, Essex-street, London, W.C.2, at 15*s*.

THE PILOCARPINE TEST FOR THE CURE OF GONORRHŒA

Dr. C. T. Mills (Worcester) writes: The following case may prove of interest, in that it indicates the efficiency of the test after a long latent period. A sailor, aged 33, contracted gonorrhœa 12 years ago. He was treated by "irrigations and injections" which, he said, "made matters worse." After this he was at sea and ceased all treatment, apart from copious bland drinks. Between three and six months later the discharge disappeared and has never recurred. On examination there were no signs of inflammation and no discharge. According to the test, as described by Klein,[1] Boss[2] and others, following Perutz,[3] I injected 4 c.cm. of a 1 in 400 solution of pilocarpine nitrate. The next morning the very slight resulting discharge was tested. Direct smears were negative; culture showed abundant gonococci. The complement-fixation test was negative. I am indebted to Dr. W. Stewart, of Worcester Royal Infirmary, for the bacteriological work.

[1] Dermat. Woch., 1929, lxxxix., 1094.
[2] Ibid., 1930, xci., 1055.
[3] Klin. Woch., 1922, No. 48.

A MELBOURNE COLLEGE OF NURSING.—A Centenary College of Nursing is to be erected at Melbourne under the auspices of the Australian Nursing Federation at a cost of £20,000.